

Musculoskeletal Disorders in the Workplace:

An examination of the underlying causes

and contributory risk factors

A Mixed Methods Study

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of the University of Chester for the award of the degree of
Doctor of Philosophy

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Declaration

The material being presented for examination is my own work and has not been submitted for an award of this or another HEI except in minor particulars which are explicitly noted in the body of the thesis. Where research pertaining to the thesis was undertaken collaboratively, the nature and extent of my individual contribution has been made explicit.

Name: Pamela Gellatly

A handwritten signature in black ink, appearing to read 'P. Gellatly', written over a horizontal dotted line.

Signed:

Acknowledgements

Firstly, I would like to thank my principal supervisor Professor Stephen Fallows for his ongoing support over the last four years and the ease of access to him and the breadth of his guidance. His energy, passion and hard work are a credit to him and the University of Chester and I could not have progressed to a PhD without his guidance. I would also like to thank Jem Warren for his support and especially in his understanding of the psychological aspects of MSDs. Thank you to Professor Elizabeth Mason Whitehead for introducing me to Qualitative Research, which I now firmly believe, is critical to understanding data involving people. Finally, thank you to Dr Mike Morris for his support on the quantitative data analysis.

I would like to pay tribute to Gordon Waddell who died this year in April but who was my inspiration for understanding the biopsychosocial approach to MSDs. His practical knowledge combined with his theoretical understanding of the body and mind has assisted clinical and non-clinical practitioners in the multifactorial nature of pain and dysfunction.

I would like to thank all of the individuals within the four participating organisations who allowed access to their data especially those who have taken this information and used the data to develop an integrated strategy for musculoskeletal disorders and all other health and wellbeing related issues in the workplace. I would also like to thank all of the individuals who participated in the research and were willing to discuss their personal experiences.

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Confidentiality

The information contained within this thesis is strictly confidential to the organisations that participated in this research due to the commercial sensitivity of the data provided. The name of the companies have been protected in the body of the document by referring to them as Company A, B, C and D but their identity may be possible from reference to their organisation size and industry type. In addition, their names are contained in the emails confirming consent to participate as provided in the appendix and are provided to the examiners to aid context but have been redacted before any publication of this thesis. Furthermore, the data within the individual case studies have been amended to retain the complexity of the issues that arise whilst protecting as much as possible the possible recognition of any individual to ensure compliance with the Data Protection Act 1998 and the guidance of the Information Commissioners Office.

Abstract

Introduction

The incidence of musculoskeletal disorders remain the most common single condition, by incidence, affecting the working population. This remains true even though the apparent historic causation of manual handling, has reduced significantly.

Back pain alone has been termed a 20th century medical disaster, which has reverberated into the 21st century, with 85% of low back pain having no clear clinical diagnosis yet individuals continue to seek a clinical solution. Understanding pain remains as complex as ever with very little evidence to suggest progress.

The overall scale and cost of MSDs in the workplace are not easily identifiable as objective and accurate data are rare. Other workplace incidence and costs are either, not recorded or not published, in documents or *grey literature*, that are generally only accessible to individual organisations on a regular basis.

Objectives

The epistemology of this thesis is complexity and the extent to which this influences outcomes. The trilogy of complexity considered includes:

1. The issues facing organisations in how they prevent and manage MSDs;
2. The individual's perspective and what they understand about possible causation, their beliefs, fears and expectations;
3. The interface with clinical and non-clinical practitioners, and whether interventions provided, are beneficial to the individual.

Consideration of the multiple perspectives that arise from the various influences affecting the organisation, the employees within that organisation and the practitioners, has been possible by the metaphoric use of a "*bricolage*" methodology, and suggests that the current medical model is no longer appropriate.

Methods

A mixed method research design comprising four studies was undertaken. Firstly, a retrospective quantitative study of data (n = 21,092) from benefits provided by four organisations followed by a qualitative case example study (n = 21) of supporting documents and clinical information. These studies then informed the need for a qualitative

study (n= 9) symptomatic individuals who participated in a focus group and (n= 6) face-to-face interviews and finally a qualitative study of practitioners involved in the provision of treatment services to the participating organisations. The data from each study informed the others and the data merged with the findings from the literature review and common interventions.

Conclusions

A disparity was found between what has been identified in literature and what actually is considered in clinical practice. The healthcare industry operates in “silos” and this separation of disciplines is reflected in organisational management. The range of underlying risk factors, evident in modern society, which are affecting or may affect an individual’s future musculoskeletal health are not being addressed by the medical model, and practitioners require training, or need to work in a multidisciplinary team, if they are to improve long-term outcomes.

This thesis discusses the complexity of the multifactorial nature of musculoskeletal health, and provides a framework to challenge current practice and promote a fundamental change in the way in we assess, and treat the range of MSDs including a move towards educating individuals to take personal responsibility.

Preface

I have worked within healthcare for over thirty years, mostly dealing with major organisations. From the outset, I was frustrated in the “silo” approach towards health management and the lack of provision to employers that helped them address the occupational health needs of their business and the people within their business.

Initially my experience was in private healthcare where frustration with standard insurance products led me to the introduction of the first Third Party (Claims) administration (TPA) company in the UK (1985), a methodology used in the USA. The intent was to allow organisations the opportunity to develop healthcare plan provision around their specific business needs. Shortly thereafter, I had discussions with Government ministers and departments to develop the first Medical Trust, to provide organisations with a legal framework for underwriting the benefit. Later developments included the launch of the first preferred network of hospitals and the development of a psychological service to manage patients in an outpatient setting, rather than the common in-patient service used at that time, both of which are now commonplace.

The data gained from this business (now part of the largest insurance company in the world) helped identify the need to manage more effectively all aspects of illness and injury on the workplace, which resulted in the development of the concept of an integrated approach to all aspects of employee health.

As part of my learning, I decided to undertake an MSc in Occupational Safety and Health (London South Bank University) but realised that what I had learnt was only part of the story. The risks were as much about the people as they were about the workplace and I then decided to take an MSc in Exercise and Nutrition Science at the University of Chester.

My academic and work experience, combined with a passion for keeping active and eating healthily, stimulated this research project. Initially the intent was to consider an investigation into integrated approach to all aspects of employee health, but this was fraught with lack of accessible data due to commercial sensitivities. As MSDs account for the highest incidence of ill health or injury in most organisations, it appeared a logical variation.

A critical personal requirement is that the findings from my PhD will have a practical value to organisations, their employees and all those that are party to the provision of benefits to those employees, including clinicians.

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Glossary of Acronyms and Abbreviations

ARMA – Arthritis and Musculoskeletal Alliance

BASEM – British Association of Sports and Exercise Medicine

BIMM – British Institute of Musculoskeletal Medicine (now folded and incorporated into BASEM)

BMM – Biomechanical model

BPSM – Biopsychosocial model

C.H.E.K – Paul Chek Institute for Corrective Exercise

CSP – Chartered Society of Physiotherapists

CPM – Chronic pain management

DOH – Department of Health

DSE – Display screen equipment

EPIC – European Prospective Investigation into Cancer

FRP – Functional rehabilitation programme

HCP – Healthcare plan

HMRC – Her Majesty's Revenue & Customs

HR – Human resources management

HSE – Health and Safety Executive

IHMP – Integrated health management provider

IOSH – Institute of Occupational Safety and Health

LBP – Low back pain

LM – Line manager

MHOR – Manual handling operations regulations

MSD – Musculoskeletal disorder

MSK – Musculoskeletal

MSK. HQ – Musculoskeletal health questionnaire

NASM – National Academy of Sports Medicine

NHS – National Health Service

NICE – National Institute for Health and Care Excellence

NPM - Neurophysiological model

NR – Not recorded

NSAIDs – Non-steroidal anti-inflammatory drugs

RIDDOR – Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013

WHO – World Health Organisation

WRMSD – Work related musculoskeletal disorders

Glossary of Terms

Capability

The assessment of an individual's ability to work and in what capacity and period. The intent would be to maintain a person at work, return them to their normal duties or short-term modification of duties. If this was not possible without an intervention, then this would be considered and evaluated for likelihood of success. Alternative duties would be considered for individuals likely to be covered by the Equality Act 2010. If this was not reasonably practicable temporary or permanent exit from the business would then be considered including: group income protection or incapacity (if available) or dismissal on the grounds that they are no longer able to perform a role.

Case manager

An individual who coordinates and actively manages all clinical and non-clinical aspects of ability to work in normal duties or in any other capacity whether absent or not. This individual takes both telephone calls direct from employees and managers in relation to the range of services outlined in chapter 1. What action is taken at the point of the call or receipt of an electronic trigger is based on the agreed processes with each participating organisation.

DSE assessments

An assessment of an individual's workstation by a physiotherapist or exercise professional, trained in assessing any issues associated with workstation for the individual that has caused or may cause harm or injury.

Document

A written, audio, computerised or other presentation of any relevant notes relating to the assessment, diagnosis and treatment of the individual.

Exercise

A physical activity that is planned, structured and repetitive for the purpose of conditioning any part of the body. It is used to improve health, maintain fitness and is important means of physical rehabilitation (The Free Dictionary, 2017). An activity carried out for a specific purpose (Oxford Dictionary, 2017).

Functional capacity assessments

Independent assessment of physical function often using technology to assess conditions such as muscle strength.

Functional rehabilitation

Conservative programme to address physical, psychological and social issues that are maintenance factors or obstacles to recovery.

Grey literature

That which is produced in documents, reports, presentations or management information between organisations (including public bodies) but which is not published or generally in the public domain but which contains valuable insights.

Medical trust

A legal arrangement for the provision of private healthcare benefits which complies with HMRC guidelines.

Occupational factors

Consideration of issues that affect ability to work with condition, age, gender or psychosocial factor e.g. grievance.

Physical activity

Any bodily movement produced by skeletal muscles that requires energy expenditure (WHO, 2017)

Physical fitness

A set of attributes that are either health or skill related (Caspersen, Powell & Christenson, 1985).

Strength and conditioning

A method for improving muscular strength by gradually increasing the ability to resist force through the use of free weights or a person's own body strength (The Free Dictionary, 2017).

Vehicle assessment

An assessment of an individual's vehicle use for business purposes by a physiotherapist or exercise professional, trained in assessing any issues associated with fit of the vehicle to

the person or the person to the vehicle to establish any issues that has caused or may cause harm or injury.

Vocational rehabilitation

The training of an individual in a manner to support a return to work but in a role, which differs, to that of a previous role.

Wellbeing assessments

Provision of lifestyle data from an online or face-to-face assessment.

Whole person

A suggestion that when assessing and treating an individual for an MSD (or indeed a range of other conditions) that consideration should be given to their physical, psychological, social, financial, occupational, environmental and any other issue that could either be affecting their health or may in the future if not addressed.

PART 1 Background to Research

Chapter 1

Background information

1. Introduction

Musculoskeletal disorders (MSDs) and in particular the experience of musculoskeletal related pain has been one of the many unanswered questions relating to a person's perception of ill health that may or may not have an underlying organic cause. The paradox of a person's belief that there is something physically wrong with them when clinicians cannot find a tangible reason has not only been of interest to the clinical profession but has fascinated philosophers for many years. Reference to pain has been found as far back as 5000 BC when Sumerian clay tablets revealed the use of opium to manage pain and many years later also mentioned by Homer in 800 BC (Chu, Clark & Angst, 2009). Hippocrates (460-370 BC) believed that pain was caused by a fluid imbalance and that the feeling of pain came from the heart rather than the brain. Plato (428-348 BC) and Aristotle (384-322 BC) saw perception of pain being different to physical causation and more akin to an emotion than a physical sensation. Later Descartes (1596-1650) epitomised a very mechanistic view known as the Cartesian model (Waddell, 2004). Since that time the emergence of the medical model, focused clinicians on physical causation. Medical anthropology and the development of the biopsychosocial model, broadened the concept of a psychological and social contribution, and believed to stem from the brain (Moseley, 2011; Moseley & Butler, 2015).

Whatever the causation or the contributory risk factors, it is not the intent of this thesis to solve a problem which has puzzled so many for thousands of years. Instead, the purpose is to consider the practical issues that arise in the workplace for employees at a physical, psychological and social level. This includes a review of how an organisation's health, safety and wellbeing policies affect the individual along with how the benefits provided may or may not assist in the assessment and management of musculoskeletal health and ill health.

1.1. Definitions

Within this thesis, the term musculoskeletal disorder (MSD) will include both work related and non-work related musculoskeletal ill health and will be defined as:

An injury or pain in a joint, muscle, nerve, ligament, tendon, cartilage or associated connective tissue.

It will encompass two hundred classifications as defined in the Official Disability Guidelines (Work Loss Data Institute, 2017) and International Classification of Diseases version 9 and 10 (WHO, 2016).

The Health and Safety Executive (HSE, 2016) define a work related musculoskeletal disorder (WRMSD), as:

One, which is caused or made worse by work

1.2. Theoretical framework

The epistemology of this thesis is *complexity*, as outlined by Kinchaloe, McLaren, and Steinberg (2013) and the extent to which this influences outcomes. The trilogy of complexity considered includes:

1. The issues facing organisations in how they prevent and manage MSDs;
2. The individual's perspective and what they understand about possible causation, their beliefs, fears and expectations;
3. The interface with clinical and non-clinical practitioners, and whether interventions provided, are beneficial to the individual.

The aim of the research is to consider whether traditional practice in the provision of employee health benefits (including the expectation of interventions that rely on the medical model) is sufficient to address the multifactorial nature of MSDs. The purpose is to evaluate whether employers need to rethink how they assess and address not only MSDs but also musculoskeletal health, in the hope that individuals are better informed and equipped to understand the possible range of causative and contributory risk factors and what they can do to take control of their own health.

The methodological metaphor of a *bricoleur* and hence *bricolage* (Kinchaloe, McLaren, & Steinberg, 2013) is applied to allow consideration of the multiple perspectives that arise from the various influences affecting the organisation, the employees within that organisation and the practitioners that aim to assess and treat the employees. Bricolage is not restrained by any single perspective and can embrace other epistemologies (Kinchaloe et al., 2011) to enhance the learnings from the research and enable practical application.

1.3. Research design overview

The research design is an explanatory sequential mixed method study as outlined by Creswell, (2003); Creswell and Plan Clark (2011) comprising:

1. A retrospective quantitative study (1a) which considers the incidence and cost of MSDs in four participating organisations;
2. Qualitative analysis of selected documents from the above (study 1b) to provide an understanding of the practical application of assessments and interventions;
3. Qualitative perspective of the experiences of symptomatic individuals (study 2);
4. Qualitative analysis of views shared from clinical and non-clinical practitioners (study 3).

1.3.1. Quantitative element

The research commenced with a retrospective quantitative study (study 1a) of data available from four participating organisations in relation to the healthcare benefits and or services provided by the organisation (Table 1).

Table 1: Participating organisations by type and UK employee numbers

Organisation and work type	Approximate number of employees (UK only)
UK Company A - with some overseas sites Offices, production sites and field engineers	2,000 employees
UK Company B – with major global coverage Corporate offices and hotels	7,000 employees
European Company C – with international operations Aviation, resort and office based staff	16,000 employees based in the UK or on seasonal secondment
UK Company D – with global operations Offices and field based staff	31,000 employees – including off shore
Total number of employees	56,000

The data from study 1 identified significant differences that outlined the extent of the possible underlying cause and contributory risk factors, but provided no indications as to the reason.

1.3.1.1. Qualitative elements

A further three qualitative studies followed to include:

1. A review of the documents, clinical and non-clinical associated with a selection of cases from the quantitative study;
2. Collection of data directly from symptomatic individuals in relation to their experience of their musculoskeletal disorder;
3. Collection of data to assess the practitioner perspective and identify the issues they face if helping individuals resolve or manage their condition.

The data from each study informed the next study and then was used to review the data in the previous studies. The data were then compared with what is or is not known or published in literature (including industry or organisational grey literature) and a model for the convergence of the study data was developed as outlined in Figure 1.

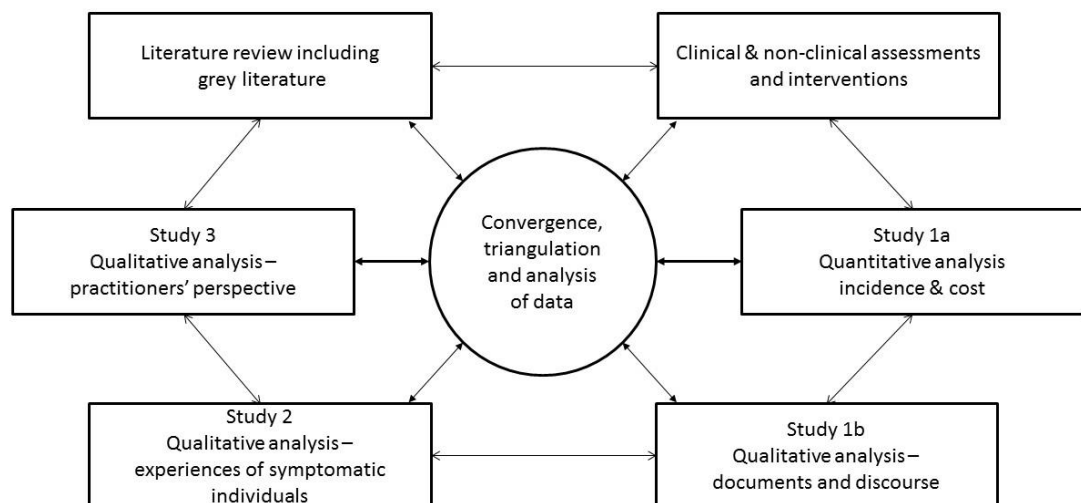


Figure 1: Explanatory sequential mixed methods research design

1.4. Multidimensional considerations

This thesis suggests that there are many facets to both musculoskeletal health and ill health and that when managing employees in the workplace it is important to consider the interrelationships with each dimension (Table 2) and that the combination of factors that can affect the onset, maintenance and severity of an MSD, that should be considered in practice.

Table 2: Musculoskeletal risk influences

Occupational	Personal	Intervention
Health	Physical	Clinical
Safety	Psychological	Non-Clinical
Wellbeing	Social	Multidisciplinary

The background to identification and management of MSDs is outlined below.

1.5. General prevalence

MSDs remain the most common single condition, by incidence, affecting the working population. This remains true, even though the apparent historic causation of manual handling, has reduced significantly (Waddell, 2004). Sickness and invalidity benefit rose exponentially within the UK during the period from 1953 to 1995 with the most significant increase occurring in the period between 1985 and 1995 (Department of Social Security, 1999a) suggesting that possible causation was somewhat more complex. During this period, the link with psychological and social phenomena, emerged and became accepted, but evidence to suggest that this approach has made a difference is not yet apparent.

Back pain alone has been termed a 20th century medical disaster, which has reverberated into the 21st century (Waddell, 2004) with 85% of low back pain having no clear clinical diagnosis (Refschauge & Maher, 2006) yet individuals continue to seek a clinical solution. Possible causation of low back pain has been deliberated for many years but understanding pain remains as complex as ever with very little evidence to suggest that progress has been made.

1.5.1. Reliance on subjective reporting

The data reported in many different publications, including those published by the Health and Safety Executive (HSE, 2016) and the Institute of Safety and Health (IOSH, 2016), are collated from a relatively small number of national surveys. This includes *The Labour Force Survey* (Office for National Statistics, 2016) which, in terms of ill health, rely on subjective reporting of both sickness absence and work-related ill health or injury.

Self-reports reflect an individual's perception and *belief* of causation that may differ if measured objectively. Reliance on subjective data means that it is difficult to quantify either the scale of the problem or the actual causation, including whether a sickness

absence is due to medical problem or whether a condition has been *caused or made worse by work*, as the individual may have this belief but the reality could be somewhat different.

1.5.2. Apparent sickness absence

MSDs are the major reason for days lost due to illness and injury in the workplace after short-term ailments. In 2016, sickness absence in the UK Labour Market accounted for 137.3 million days lost of which 34 million days were lost due to minor illnesses, 30.8 million days (due to musculoskeletal conditions), 21 million days for “other” and 15 million days were lost due to stress, anxiety and depression (Office for National Statistics, 2016). This represented a further reduction in MSDs and mental health of 6% and 12% respectively, compared to the 2015 survey, continuing a downward trend which from the sickness absence data alone could suggest that these illnesses are being reduced hence observations on the possible limitations are made in 2.2.3 and from the data in 5.2.

1.5.3. Apparent work-related incidence

Apparent or perceived work related MSDs (WRMSD) reported in 2016/17 suggests 1,550 cases in every 100,000 employees or 39% of all work related ill health, (507,000 out of 1,299,000), with an incident rate of 480 new cases per 100,000 workers and 8.9 million days lost. The HSE suggest that the combination of workplace psychosocial factors (e.g. organisational culture) and the interaction between health and safety climate and human factors, are more likely to cause an MSD than any single condition but fail to recognise and suggest how to prevent and manage the risks identified in this thesis.

Work related upper limb disorders (WRULDs) was 700 cases per 100,000 workers (229,000 total cases) with 3.9 million days lost (average 17.2 days) in 2016/17 whilst back pain was 590 cases or 194,000 total cases (down from 660 in 2015/16) and totalled 3.2 million days lost or 16.5 days (HSE, 2017). This average is consistent with the length of absence for non-work related LBP, identified in the data outlined in chapter 5.

Mental health was reported to be a prevalence rate of 1610 per 100,000 lives or 720 new cases (526,000 out of 1,299,000 or 40% of all work-related ill health). Total number of days lost was 12.5 million at an average of 23.8 days lost per case.

Incidence of mental health and MSDs is easily confused when work-related causation is not positioned in perspective to overall incidence.

1.5.4. The scale of workplace prevalence and incidence

The overall scale and cost of MSDs in the workplace are not easily identifiable as objective and accurate data are rare. Workplace prevalence, incidence and cost are either, not recorded or not published, in documents or *grey literature*, that are generally accessible to organisations on a regular basis.

Whether MSDs are still such a major problem has been distracted by the focus on the need to address the scale of stress, anxiety and depression. The omission of musculoskeletal health, was evident at the summit on *Committing Construction to a Healthier Future*, 2016 organised by the Health in Construction Leadership Group, 2016, whose sole purpose is to enable the construction industry to be as successful in managing health as they have been over the years in managing safety. Speakers included: Dame Carol Black, specialist advisor to the Department of Health; Richard Judge, Chief Executive HSE and an array of other keynote speakers, yet MSDs were not mentioned. This could suggest to the two hundred construction companies present that musculoskeletal risks are either deemed to be well managed or are inherent to the job and nothing more can be done. In the absence of data providing a fuller understanding, such positioning may mislead managers not to consider further risk reduction and control strategies.

Focus on mental health in other major publications (Black, 2008; Black & Frost, 2011), may foster the belief that the drive to reduce the physical risks associated with work (e.g. manual handling) has been successful. General guidance from the HSE on MSDs reinforces avoidance as the strategy for reducing risk and provides very little advice on personal risks, suggesting that lifting, pulling and pushing is what causes harm and if avoided can eliminate or reduce risk to employees. A strategy, which ignores the multifactorial nature of MSDs, and unlikely to deliver the intended outcomes as evident from the data accessed for this thesis.

1.6. Overview of the data accessed

The findings from this research is that back pain and a wide range of other MSDs remain the major reason for ill health and injury incidence and associated costs, as outlined in chapters 5 to 8. The prevalence and cost revealed to the participating organisations, during the collation and analysis process, provided previously unknown data to them. The apparent reason for this was a “silo” approach to health and any associated benefits, within each business and the complexity relating to the ability to identify and report across divisions or business units. The data revealed segmentation of MSD risks, controls and

benefits combined with a fractured assessment and intervention process. Both internal and external practice and data analysis has led to an incomplete picture of causation and contributory factors.

1.6.1. Snapshot of organisational feedback

During the data collation and analysis process, the participating organisations requested an update on findings specific to their business. The response, without exception, was of surprise at the prevalence and associated cost. A comment from a senior Health and Safety manager summarised the issue:

“We thought that we had resolved our musculoskeletal problem. Occupational Health had advised us that mental health is the main reason for management referrals and this is why in recent years we have focused on mental health”

The reason for this misdirection was occupational health referrals were only one data source and as identified in chapter 5, not consistent across the other areas of data accessed during this project. This suggests that such missing data are relevant in understanding the scale, cost, impact to employees and the business of MSDs in the workplace.

1.7. Missing data and data flaws – occupational health, safety and benefits

The benefits provided for employees within each of the four participating organisations varied in a number of ways as identified in chapter 5. The intent of this thesis is not to examine the details or make comparison between the benefits provided unless this is relevant to any findings and a summary of the main sources and issues summarised in Table 3 below.

Table 3: Benefits reviewed, musculoskeletal prevalence and data capture sources

Data Type	General prevalence	Source	Data type and accuracy Issues
Sickness absence	Circa 24-40% of days lost	HR database	Reported in National Statistics and grey literature Quantitative and qualitative data from this study from Company A and D only (including audio files). Comparison of data between organisations difficult due a wide array of variables (chapter 5)
Management referrals	Unknown	OH database	Incidence generally not reported in literature and comparison difficult due to definitions e.g. case and episode. Quantitative and qualitative data from this study (all organisations) including: management advice line (audio only) and management referrals (documents and audio). Data included: GP reports; specialist reports; practitioner reports (e.g. physiotherapist); accident report forms; personal information such as height, weight, exercise, and psychosocial factors; job type, tasks and hours; independent assessment reports; functional capacity assessments; responses to various validated assessment tools and other documents that may be appropriate to the management of a case.
Employees on modified duties	Unknown	Not recorded	Not recorded by any participating organisation.
Healthcare plans	Circa 40-50%	Claims database	Data accuracy good due to legal and financial compliance but issues of comparability. Data accessed included: assessment forms; GP reports; specialist reports; practitioner reports; clinical scrutiny forms; MRI/CT scans; X-rays; FCA and FRP reports.
Accident/disease incidents	Unknown	HSE/RIDDOR	Although legislation requires accuracy, issues do exist in reporting especially where there is not a specific incident. An MSD can be reported as work-related when causation may be different. Quantitative data not made available by any participating organisation but qualitative data referenced in chapter 6 and 7.
Employer's liability claims	Unknown	Claims database	General prevalence not reported and quantitative data not made available by any participating organisation. Qualitative data limited to one case in chapter 6.
Group income protection claims	Circa 40%	Claims database	General prevalence not reported. Information collated during this study similar to management referrals. Quantitative data not available from any of the organisations but qualitative references in chapter 6 and 7.
Incapacity claims	Unknown	Claims system	Quantitative data not available from any of the organisations but qualitative references in chapter 6 and 7.
Work station	Unknown	Not recorded	General prevalence of MSDs and association with workstations not reported. Little reference to personal risks. Quantitative data not available from any participating organisation. Qualitative data outlined in chapters 6 (office workers).

Table 3 continued: Benefits reviewed, musculoskeletal prevalence and data capture sources

Data Type	Incidence	Source	Data source and accuracy Issues
Vehicle assessments	Unknown	Not recorded	<p>General prevalence of MSDs and association with vehicles not reported although literature exists on MSDs and driving but little reference to personal risks.</p> <p>Applicable to Company A and D but prevalence not available.</p> <p>Quantitative data accessed includes: anthropometrics of the individual; driving dimensions of the vehicle; physical characteristics of the individual; functional restrictions e.g. tight hamstrings, tight hip flexors; any underlying medical conditions.</p> <p>Qualitative data includes likes and dislikes of vehicle; image; family usage and other personal preferences; like or dislike of job; any issues with traveling and other similar aspects associated with work or any financial benefit are also available in some cases.</p>
Wellbeing	Unknown	Not recorded	Musculoskeletal health rarely considered and not assessed in any health screening assessments undertaken by the participating organisations.

1.8. Published organisational data issues

Data collected and reported in national statistics, health and safety publications and privately funded surveys are reliant mostly on subjective data from individuals or from organisations and unlikely to represent an accurate reflection of prevalence and incidence. This may lead to the implementation of inappropriate control strategies that will fail to address causation. Sources of musculoskeletal prevalence, incidence and cost, from the benefits outlined in Table 3 (page 10) and chapter 5 are not published in the public domain.

1.8.1. Health and safety data

Health and Safety legislation identified exposure to manual handling as an occupational risk factor that could lead to a musculoskeletal injury or disorder. The introduction of The Manual Handling Operations Regulations (1992) suggested implementation of strategies to eliminate or reduce exposure, yet incidence and disability appears to have continued to rise (Waddell, 2004). Evidence to support why this may be the case is not apparent in public literature, nor does it appear to be recorded by organisations, hence a true understanding of occupational causation remains unknown to organisations and the Government.

1.8.2. Occupational health data

The data identified across the four participating organisations within this research project suggests that although MSDs are still prevalent in workers involved in active and strenuous roles, sedentary workers also experience a high prevalence, but can remain in, or return to, work easier. This would indicate that MSDs are potentially being caused or contributed to by other constructs (e.g. sitting and inactivity) as identified in research associated with sitting and body composition (Smith, Thomas, Bell & Hamer, 2015).

1.8.3. Employee benefit provision data

The data from the various benefits provided by these organisations including: sickness absence; case management; healthcare plans; access to private physiotherapy; group income protection and incapacity suggest that MSDs rank significantly above any other single condition in terms of incidence and cost. The exception to this may be sickness absence for mental health reasons where the number of days lost may exceed that of MSDs due to a longer length of absence per episode e.g. 28 days compared to 16 days for MSDs.

1.8.4. Wellbeing provision

The promotion of workplace health and wellbeing has become more common in recent years. Whilst occupational health provision may support employers with health and safety compliance, wellbeing professionals, as a subset of occupational health or as a separate entity, actively aim to drive the strategic intent of many employers, to ensure that employees are *Healthy, Happy and Here*. Proving or predicting cost effectiveness of such programmes continues to present challenges (Bolnick, Millard & Dugas, 2013) and research which connects the relationship between health risks and work productivity such as that by Boles, Pelletier, & Lynch, (2004) and Pelletier, Boles, & Lynch, (2004) difficult to quantify.

A review of the grey literature provided by three major wellbeing organisations omitted any reference to musculoskeletal health. Validation of their on-site wellbeing provision also excluded any assessment of musculoskeletal function except where one organisation provided a basic postural assessment. This was an unexpected finding when musculoskeletal ill health ranks significantly above any of the other conditions featured in a wellbeing programme.

1.9. Musculoskeletal health risk “gaps”

Whilst the components of organisational health, safety and wellbeing is one aspect of what has been considered within the thesis, the evidence relating to the understanding of personal risks by symptomatic individuals and any supporting practitioners was also explored.

1.9.1. Personal lifestyle risks

The Labour Force Survey, (Office for National Statistics, 2016) outline the percentage of the population who are overweight or obese; fall below the Government guidelines on activity and strength and conditioning training and/or have poor nutrition. The knowledge of public health risks, and the link to MSDs, has been evident for more than twenty years (Woolf, 2012) but rarely feature in the diagnostic or intervention MSD pathway (Woolf, Breedveld & Kvien, 2007; Miller, et al., 2013). This suggests that clinically these factors are not thought to be relevant to treating an MSD, except in specific circumstances (e.g. osteoarthritis of the knee and weight loss) as identified in osteoarthritis research (Messier, et al., 2004; McLannahan & Clifton, 2008)

The links between negative lifestyle risks to cardiac, cancer, diabetes and mental health are apparent in public health and wellbeing materials but published links between these risk factors and MSDs are scarce.

The personal risks are discussed further in 2.5, outlined in the data in chapters 5 to 8 and 9.5.2.

1.9.2. Age

Ageing is inevitable yet physical activity, good nutrition and weight management may be used to counteract the ageing process (Bean & Pu, 2006, pp 311; Wroblewski, Amati, Smiley, Goodpaster & Wright, 2011). The effect of negative lifestyle behaviours become more apparent in later years and likely to affect levels of disability and mobility (Rejeski, Marsh, Chmelo, & Rejeski, 2010; Lopez-Otin, Blasco, Partridge, Serrano & Kroemer, 2013) which if understood are factors that most people would wish to avoid.

1.9.3. Work

The impact of an occupation on the individual (Katikireddi, Leyland, McKee, Ralston & Stuckler, 2017) or the individual on their occupation and the associated management of a musculoskeletal condition may not be understood (McMillan & Carin-Levy, 2012, pp 281-300). Psychological stressors whether caused, made worse by work or perceived to be made worse by work can be causative and contributory risk factors to MSDs (Deverux & Rystedt, Kelly, Weston & Buckle, 2004). Whilst jobs which are regarded as strenuous (e.g. construction) or active (manufacturing) may be considered high risk for MSDs due to the manual handling, certain occupations (e.g. HGV drivers and technical service engineers) combine the risks of sitting, often for many hours in a working day and manual handling. Such roles straddle a sedentary and active role but life on the road exposes the individual to other risks including the stress of driving long distances or driving in traffic, and eating high sugar and/or high fat foods available from service stations (Robb & Mansfield, 2011). Drivers on business may also face the additional pressure of dealing direct with customers (Raanaas & Anderson, 2004). Lifestyle factors in such populations are compounded by the difficulties associated with the tiredness of driving, inability to exercise during a work day and the motivation to exercise when arriving home after long shifts.

1.9.4. Psychosocial

The link between MSDs and psychological issues (e.g. negative attitudes, beliefs and social factors) relating to the MSD, pain, work satisfaction or financial compensation, has been

well-documented (Kendall, Linton & Main, 1997; Burton & Waddell, 2004) in government publications and clinical journals. Such maintenance factors or obstacles to recovery can, if not identified and treated, affect the likelihood of an individual returning to normal function (for them), and health (Waddell, 2006) and work (Kendall, Burton, Main and Watson, 2009).

The link between psychosocial factors, comorbidities (e.g. depression) and MSDs are less understood (Wang, Ahrens, Rief, & Schiltenswolf, 2010) and understanding that management of a psychosocial risk could prevent the chronicity of an MSD and a psychological problem is not identified as a consideration within a standard MSD care pathway.

1.10. Research and practical application of psychosocial issues

The findings from this research suggest that the well-recognised and accepted theoretical principles are not apparent in common practice. The relevance of psychosocial factors in the maintenance of a musculoskeletal condition and a genuine obstacle to recovery has been recognised since 1977 when Engel first wrote about this phenomenon followed by numerous publications by a number of well-known clinicians and researchers including: Kendall, Linton and Main, (1997); Borrell-Carrio, Suchman, and Epstein, (2004); Waddell (2004); Main, Sullivan and Watson (2008); Derebery and Anderson (2008). Kendall, et al., (2009). Yet it is not known how many clinicians assess these factors as part of their treatment pathway (Bishop & Foster, 2005). In discussions with patients and practitioners it is evident that whilst conceptually the biopsychosocial model (BPSM) is understood, the conversion of the theory into real world practice is somewhat lacking.

The modifiable and non-modifiable elements that need to be considered during the assessment and management process are outlined in Table 4 (page 17). To what degree these aspects are relevant to an MSD episode are often associated with individual characteristics, association with and timing of a psychological stressor, or social influence from either the past or the present. Psychosocial factors can underpin behaviours and active modification of negative lifestyle factors, reduce the risk of incidence or severity (chronicity) and ameliorate or attenuate the risks associated with the non-modifiable behaviours (Burton, 2005; Derebery & Anderson, 2008).

1.11. Health risk management

The risk factors outlined in Table 4 and their interrelationship with each other, is far reaching and outside the scope of this thesis. The key focus is limited to the original lines of enquiry aimed at understanding:

1. How age, gender and the modifiable factors are currently assessed and managed within organisational health, safety and wellbeing strategies;
2. What symptomatic individuals understand about these possible risk factors and what action they take;
3. What practitioners take into account when assessing and treating patients;
4. How is clinical and non-clinical research, reflected in practice.

Table 4: Non-modifiable and modifiable risk factors

RISKS	Modifiable					
Non-Modifiable	Biomechanical & Biological	Weight	Activity & Exercise	Nutrition	Psychosocial	Work
Age	Changes likely to occur with age as part of degenerative process and may be exacerbated/ mitigated by occupation, activity	Can increase	Can decrease	May not be supportive	May develop negative beliefs	May become more difficult
Gender	Specific changes e.g. childbirth/hormonal may affect MSK system	May fluctuate	May not be sufficient	May be high in sugar/ lack appropriate fat & protein	May be hormonal	May involve lifting, manual handling
Ethnicity	Varies based on anthropometric genetic/ethnic differences	Maybe genetic issues	May contribute to attitude	May be high sugar, high bad fat, lack protein	May drive negative attitudes and beliefs	May drive negative behaviours
Culture & Family	May influence lifestyles which may impact on such factors	May drive focus away from self	May make it difficult to exercise	May drive inappropriate food choices	May cause additional stressors	May be a conflict to say family
Experience & Exposure	May contribute to issues dependent on Exposure	May help/ hinder maintenance	May help/ hinder involvement	May help/ hinder choices	May help/ hinder psychological	May help/ hinder job type/ satisfaction
Comorbidities	May affect development and or function, nutrition to system	May cause increase/ decrease	May mean exercise is difficult	May affect food choices	May affect coping strategies	May affect mood
Other Social Factors e.g. Education	May impact on physical issues	Higher risk of excess weight	Risk of inactivity and lack of exercise	Higher risk of poor nutrition	Can be a significant factor	May affect type of work e.g. more manual

1.12. Aims of this thesis

To identify the scale of MSDs within the participating organisations (chapter 5), and the range of occupational and personal risk factors that may have caused or contributed to the onset and maintenance of an individual's condition and the impact on ability to work as discussed in chapters 5 to 8.

Whether these issues are addressed by: the management of safety and health; the provision of health and wellbeing benefits; the reliance on clinical interventions within any benefit provided and the availability of any non-clinical support is explored in chapter 9.

1.12.1. Excluded from scope

With the exception of age and gender, the non-modifiable factors (Table 4) will be excluded from discussion. The modifiable risks will be included but due to limitations in data collection and accuracy only brief references will be made to nutrition, smoking and alcohol consumption.

1.12.2. Within scope

The focus of the thesis will be to consider how the combination of occupational, weight, inactivity and psychosocial factors are appraised when managing safety, health and wellbeing within organisations and whether practitioners, when treating symptomatic individuals, consider these multidimensional constructs.

1.13. Reflection and contribution

The published literature relating to MSDs appears to suggest that the underlying cause and contributory risk factors remain as much a mystery today as they did thousands of years ago.

We appear afraid of suggesting that individuals have personal responsibility for their health, instead preferring to suggest causation of some external factor. After years of promoting avoidance strategies, some of which were with good intent, the unintended consequence could be that we have inadvertently increased the rate of normal degeneration and reduced strength and conditioning to work and to life. The exponential increase in MSDs following the elimination or reduction of manual handling suggests that other factors are at play.

MSDs have become the nemesis predicted by Eugene Sandow, physical culturist and physician to King George V, in his book *Life is Movement* (1920) where he stated:

“This book is a serious attempt to grapple with one of the greatest problems that has ever confronted the civilized to meet a crisis which beside which the terrible blood bath from which the world has just emerged is but a bagatelle. For it deals with the serious menace of physical deterioration and the prevention and eradication of disease, the most devastating enemy that humanity has ever had to face. Where war has killed millions, disease is killing tens of millions”.

Sir Arthur Conan Doyle in the forward to the book, also wrote:

“If it could be shown that the body developed at the expense either at the mind or of the character, the physical degeneration might be accepted as the price that which the human race must pay for its mental and spiritual advance. But the facts are the very opposite. Vice and ignorance are the companions of ugliness. That which is physically beautiful stands in the main for that which is mentally sane, and spiritually sounds. The classic ages of Greece, which showed the biggest intellectual average in this world in a single population produced also the finest physical types, which the sculptor has ever committed to marble. The man who can raise the standard of physique in any country has done something to raise all other standards as well.”

It is believed that the data within this thesis provides a unique contribution to the multiple perspectives inherent in employee health to help drive future research that considers the *whole person* and not any singular component part or determinant. The identified gaps in Government policy relating to health from a safety perspective, a workplace management dilemma and clinical provision are all integral to resolving the issues. Employers can play a major role in the paradigm shift and help to drive both Government, provider and organisational change. Gaps in the provision of wellbeing advice whether public or private should be easy to address and underpin the necessary prevention strategies. Changing clinical practice may be more complex but should commence with the training of practitioners and the development of multidisciplinary teams if we are to reduce the individual, organisational and state burden of MSDs. This thesis does not intend to suggest that the possible underlying causes outlined are exhaustive but instead aims to explore the multifactorial and multidimensional phenomena that can impact individuals in different ways and to different degrees in the hope that those touched upon and no doubt many more may be considered when and where appropriate in the future.

Chapter 2

Literature Review

2. Introduction

The timing of the conduct of a literature review is a topic for debate amongst quantitative and qualitative researchers. Whilst the former may tend to prefer to review the literature prior to commencement of the research to help formulate the research question/s the latter often allow the data to emerge and themes identified and then compare with previous research findings. Research material collated prior, during and post the data collection and analysis process allowed this literature review to become a dynamic process to aid reflection and the evolution of knowledge. Each study and external data collation exercise converges to reflect the non-linear nature of this thesis.

This literature review includes reference to pertinent literature available prior to the commencement of Study 1a (quantitative study) which helped inform or further develop the research questions. The data from Study 1b (qualitative) informed the need for further literature searches based on the data as it emerged from Study 1b, Study 2 and Study 3. Finally, a review of more recent publications, (including relevant grey literature) which align or disagree with the findings of this thesis as defined within the inclusion criteria were reviewed.

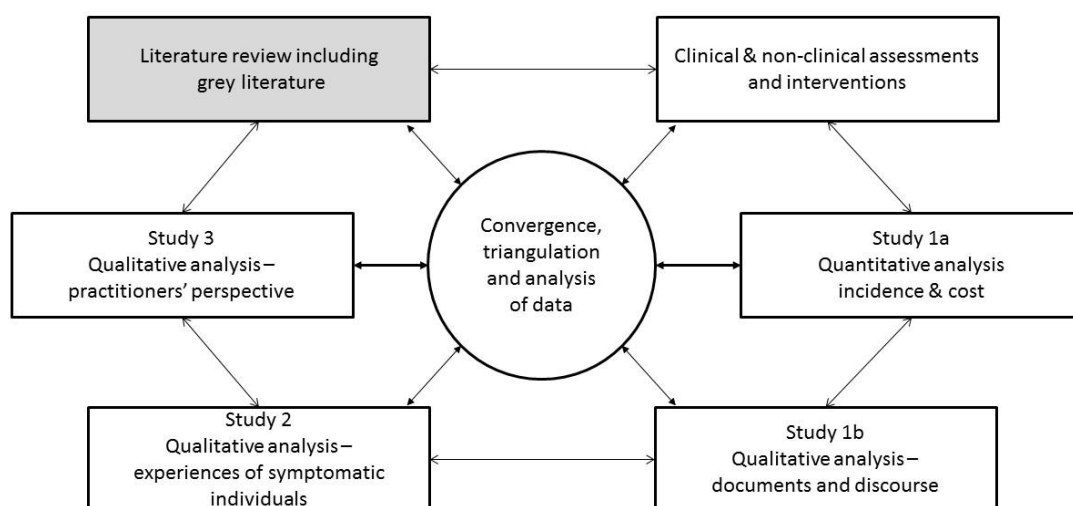


Figure 2: Explanatory sequential mixed methods research design – Phase 1

This chapter aims to highlight the information available on:

1. The scale of the musculoskeletal health and ill health;
2. The occupational and legislative influences on workplace musculoskeletal health, ill health and injury;
3. The personal risks factors associated with physical, psychological and social influences.

The occupational and personal paradigms are discussed within the disciplines of: *Health* and the provision of healthcare benefits; *Safety* and the legislative requirements and complexities; *Wellbeing* and the limitations within the context of assessment and information on prevention or risk reduction of skeletal muscle ill health or injury.

2.1. Methodology

The content of this thesis covers a number of different areas of research including: human capital information technology; human resource management; occupational health and safety management; clinical publications and sports and exercise medicine.

A search of the literature in these main areas was conducted and included access to the following databases: SocINDEX; Web of Science; PubMed; Medline; CINAHL; and AB/Inform Global.

2.1.1. Inclusion criteria

The overall timescale was between 2000 and 2017 to cover some important publications in the early years of the new millennium on the relevance of understanding the psychosocial factors. The initial search, on the covariates, prior to the data analysis, was between 2010 and 2015 and updated in 2017 to reflect the findings from the four studies. The exception to this was where an earlier publication was relevant to a specific topic (e.g. psychosocial research).

National statistics and articles from Europe, USA, Canada together with articles from Australia, and New Zealand; which considered multifactorial risk factors even if they did not study them were reviewed.

The focus for the literature review was associated with MSDs and the modifiable behaviours (weight, activity, nutrition and psychosocial), age, gender, and occupation.

2.1.2. Exclusion criteria

Articles that were very specific to a subject area with little relevance to this thesis; and articles prior to 2000 unless they met the exception criteria.

2.1.3. Results

The search criteria used identified a considerable volume of journal articles between 2000 and 2017 relating to quantitative and qualitative studies. The number of articles that focused on the identification of a linear relationship with one construct and another e.g. low back *pain* and excess weight, were excluded where the content of the article did not inform the specific research questions but included where relevant. Those that considered the multifactorial dimension or a relevant phenomenon (e.g. work, psychosocial factors and MSDs) were reviewed. Grey literature was accessed where relevant. (e.g. from private wellbeing providers) but not referenced due to the commercially sensitive nature of the material.

The quality criteria used to assess the main articles included:

- Was there a clear definition of what the research was trying to achieve and why?
- Did the authors demonstrate a detailed understanding of the subject matter?
- Were there potential other reasons that could challenge the findings from the research? For example, the training or knowledge of the practitioner;
- Could the absence of any consideration of covariates affect the results, if so how?

2.2. The scale of musculoskeletal health and ill health

MSDs represent a major aspect of ill health within populations worldwide as outlined in chapter 1. Workplace musculoskeletal health and ill health arise within two separate but intertwined health prevention and management constructs commonly referred to as *Health and Safety* and *Health and Wellbeing*. The literature refers to aspects of both population and occupational prevalence but appears to limit the occupational focus to two key areas namely sickness absence (Labour Force Survey, 2016) and work related injuries or disease (HSE, 2016).

2.2.1. General prevalence

MSDs are highly prevalent in primary care (Jordan, et al., 2010; Carlson & Carlson, 2011; CSP, 2016) and for onward referral for physiotherapy, diagnostics, trauma and orthopaedics. This occurs even though they are predominantly non-traumatic injuries with

a broad differential diagnosis and despite thorough history taking and examination, often remain without a specific diagnosis (Waddell, 2006; Carlson, & Carlson, 2011). They are the most common cause of repeat GP appointments and account for up to 30% of a GP caseload with a higher proportion of elderly patients (CSP, 2016).

Identification of the true prevalence and cost of MSDs to public organisations (e.g. Department of Health) or employers is limited and this problem is evident across Europe (Mantyselka, Kumpusalo, Ahonen & Takala, 2002). The burden of MSDs on society was reflected in the labelling of the ten-year period (2000-2010) as the Bone and Joint Decade (Woolf, 2000), and this has now been extended for another decade, (2010-2020) where the need to take action has been as endorsed by the United Nations and the World Health Organisation (Woolf, 2011, 2012). Woolf and Pleger (2003) predicted that incidence would continue to increase beyond 2010 due to the burden of excess weight and physical inactivity but to what extent this has occurred is difficult to estimate entirely from the literature.

Low back pain (LBP) alone, is said to be the leading cause of disability worldwide (Hoy, et al., 2014a), accounting for roughly half of sickness absence, long term incapacity and early ill health retirement the UK (Waddell, 2006; Bevan, Passmore & Mahdon, 2007). Yet, the increase in disability and chronicity has coincided with a decrease in physical activity at work (Waddell, 2004; Deyo, Mirza, Turner & Martin, 2009) which somewhat contradicts previous views that manual labour was the major cause of LBP (HSE, 2015). Strenuous work has been found to reduce function in later life whilst leisure time activity can be protective (Leino-Arjas, Solovieva, Riihimaki, Kirjonen & Telama, 2004). These authors also found a relationship with excess weight, smoking, social class and presence of a chronic disease as a predictor of poor functioning in later life and was based on subjective reporting. Clarification of other confounding factors: whether participants were involved in strenuous activity at work, undertook any form of exercise outside of work that could counteract the physical demands, whether they enjoyed their work, the quality of their nutrition and whether they had other social factors that may have increased their risks, were not apparent in this study.

2.2.2. Workplace prevalence

The prevalence of MSDs in the workplace remain the most significant single classification of illness for short and long-term absence (Labour Force Survey, 2016), and accounted for around 40% (including arthritis) of incapacity benefits (DWP, 2011).

The two main published records of MSD prevalence and incidence (which vary based on the size of the organisation) are sickness absence and work related injuries (Labour Force Survey, 2016; HSE, 2016). Whilst sickness absence tends to be the responsibility of line management (LM) and or human resources (HR) the incidence of work related absence, illness or injury falls within the remit of the health and safety manager and or risk management.

Occupational factors, such as strenuous activity (Sainio, Martelin, Koskinen & Heliovaara, 2007) and combined roles of driving and manual handling, are known for increased self-reported prevalence of MSDs (Leino-Arjas et al., 2004; Chen, Chang, Chang & Christiani, 2005; HSE, 2016) as are awkward postures and roles that include long and or late shift work (Jzelenberg, Molenar & Burdorf, 2004; Parkes, Carnell & Farmer, 2005).

Reference to the prevalence or extent of MSDs from the provision of employee benefits including: incidence and cost of private healthcare claims; provision of private treatment for employees who are not members of a healthcare plan; employer's liability claims; group income protection claims and number of workers on modified duties does not appear to be discussed in public literature. Such data are available within grey literature accessed during this research from major insurance companies, occupational health providers and wellbeing organisations. These data are relevant to each participating organisation and only published by the provider for the internal use of their customer. The data are retained by the manager responsible for the provision of the specific service and rarely is such data communicated to other managers as outlined in chapter 5.

These findings combined with the absence of any studies that relate to a consolidated data collation across all musculoskeletal related service and benefits infers that the extent of the problem may not be identified and the significance to the organisations and the state not known (Bevan, Passmore, & Mahdon, 2007; Bevan, et al., 2009).

2.2.3. Sickness absence management

The percentage of sickness absence (days lost divided by total number of working days available based on number of full time equivalent employees) and the number of day's lost per employee, are the two major measures of musculoskeletal ill health in the workplace (Labour Force Survey, 2015). The information from this survey reported that the number of days lost in the UK due to MSDs (MSDs) was, 32.4 million days, or 23.4% of the total. In 2016, this had declined by 6% over the year (April, 2015 to May, 2016) to 30.8 million days (22.4%), based on similar numbers of employees in the labour market.

The sickness absence data over the last seven years has demonstrated a downward trend from 39.3 million days in 2009 to the current 30.8 million, with the exception of one year 2014, where it increased to 35.6 million from a figure of 30.6 million in 2013, but the reason for this decline is unknown. Data outlined within grey literature would not support the indication of a decline in MSDs suggesting either that the actual sickness absence data are not being captured (Barham & Begum, 2005) or the number of people who remain at work with a condition or transfer to an income protection benefit or incapacity are not being tracked. As an example, the sickness absence data captured for this research suggests a far higher number of days lost than the national average of 4.4 days. Company D, where data are more robust is circa 8.7 days (having reduced from 9.9 days following the interventions implemented in August 2016) is consistent with organisations with 5000 or more employees where 9.4 days is the reported average (CIPD, & Simply Health, 2016). The data presented in this report suggest stress, acute medical conditions and mental health are the top reasons for absence. This arises when using the total number of days lost but the percentage of MSDs and back pain (which they separate) in this report appears very low and not consistent with the findings from this thesis as discussed in chapter 5.

Data from a variety of other sources suggests that has been an exponential increase worldwide in ill health costs associated with low back pain alone (O'Sullivan, et al., 2016) which is supported by the findings from this research where a CCG and Health and Social Care Trust commented that the increase in MSDs is no longer sustainable (chapter 8).

The management of sickness absence is complex and may involve consideration of the following:

1. Line management and HR have to rely on the individual self-reports for the reason for their absence, and this is often unreliable for short-term absence;
2. GPs and other clinicians may not assist in the process (Arrelov, Alexanderson, Hagberg, Lofgren, Nilsson & Ponzer, 2007);
3. Interventions may be considered too late (Arnetz, Sjorgren, Rydehn, & Meisel, 2003) and/or be appropriate;
4. Sick pay benefit can promote increased absence (Waddell, Burton, & Kendall, 2009) as evidenced by higher absence rates in organisations with long-term sick pay benefits (Odeen, et al., 2013);
5. Impact of significant others (Brooks, McCluskey, King & Burton, 2013);

6. Gender differences (Dionne, et al., 2007);
7. Patient experiences with GPs and other clinicians (Anaema, van der Giezen, Buijs, & van Mechelen, 2002; Coole, Watson & Drummond, 2010);
8. Experience with other health and social agencies (Hubertson, Petersson, Arvidsson & Thorstensson, 2011);
9. Job type and ability to return to normal duties based on nature of MSD and fitness to perform tasks or safety critical nature of work (Sainio, et al., 2007).

Employees may visit a GP to legitimise their illness, to prolong an absence or to access benefit (Main, Sullivan & Watson, 2008). Line management and HR in larger organisations will then try to establish the reason for absence in more detail. This often relies on a referral to an Occupational Health service (Waddell, 2004 pp 353), which may be internal or external, and or the access to medical information via GP and specialist reports or clinical notes. Each of these approaches have a number of flaws and the interaction with the various parties can impact on the rehabilitation of the employee back into the workplace and to reduce future episodes of sickness absence (Henderson, Glozier & Elliot, 2005; Hubertsson, et al, 2011).

An employee or their manager may believe that to facilitate an early successful return to work an active intervention is required (Waddell, Burton & Kendall, 2009). Integrated healthcare management and flexible and targeted return to work programmes are more likely to achieve results than treatment alone (Waddell, Burton, & Kendall, 2009). Personal characteristics, intrinsic motivation, preparedness to engage in self-help and work fulfilment or concern about colleagues are considered significant attributes for individuals to remain at work whilst suffering with an MSD (Larsson, Karlqvist & Gard, 2008; de Vries, Brouwer, Groothoff, Geetzen & Reneman, 2011).

2.2.4. Occupational Health management referrals

The traditional Occupational Health service employs occupational health nurses and occupational health physicians to assess the illness and injury risk and establish fitness for work and in what capacity (Waddell, 2004 page 355). To formulate a judgement may include a face-to-face assessment by a nurse or the physician and possible access to GP records (Waddell, 2004 pp 402) and guided by the Data Protection Act (1998) and Equality Act (2010). Often the practitioner is reliant on subjective reporting of an individual's

perception of a problem that may be “bothersome” to them but could be quite normal and does not mean that disease is present (Waddell, 2006).

The occupational health nurse and physician are generalists (unless they have taken additional qualifications) and they are dependent on the information available from the employee’s supporting clinician, for example a GP, surgeon, orthopaedic physician, physiotherapist or similar (Waddell, 2004 pages 402-410). Hence, the focus tends to be on the medical model of assessment and treatment (Lederman, 2010). A more progressive occupational health service may use a musculoskeletal specialist as a complementary service. In which case a practitioner with training in the biopsychosocial model would be the preferred specialist (Breen et al., 2007; Waddell, Burton & Kendall, 2009) but the OH professionals may not know how to assess the competency of such individuals.

Organisations without an occupational health service, may count on HR accessing the information direct from the clinicians (Stephens, Hickling, Gaskell, Burton & Holland, 2004). This presents two main challenges: firstly, the issues associated with the Data Protection Act (1998) as guided by the Information Commissioner’s Office (ICO online 2017); second the issue of capability (training, knowledge and experience) of an HR professional to interpret medical information and the potential legal challenges that could arise from such a process (Kloss, 2005).

The GP is the patient’s advocate and likely has little musculoskeletal or occupational health training (Coole, Watson, & Drummond, 2010), unless he or she has incorporated additional specific training in these areas as part of their continuous professional development or accesses information from the regular publications of the Faculty of Occupational Medicine. In responding to requests for information, GPs have to interpret their patient’s account of the nature of their work and impact on their condition. Hence, GPs may err on the side of caution and conclude that they cannot comment on ability to work (Waddell, Burton, Nicholas & Kendall, 2009).

This paradigm was recognised by, Dame Carol Black and David Frost (2008), which led to the introduction of the fit note in 2010 with the aim of asking GPs to state what the patient could do rather than what they could not do. Whilst more and more GPs and especially those with some form of occupational health training have changed their approach (Hann & Sibbald, 2013), some cautious comments are still observed as outlined in the analysis of the documents (chapter 5). Guidance for physicians in general is provided by the DWP (2015c) and information on risk, capacity and tolerance can be found in publications such

as *Vocational Rehabilitation* by Waddell, Burton & Kendall, (2009) which is an extensive guide to MSDs and strategies to return individuals to work. The publication commissioned by a group of stakeholders representing the UK Government, employers, unions and insurers in association with the Industrial Advisory Council provides a review of the scientific evidence to broaden knowledge on occupational health and offers valuable reference material to any practitioner wishing to access guidance.

Fitness to work comments are also expected of many specialists who may be skilled in understanding the specific medical condition but are unlikely to have any precise information on job role and tasks or occupational health background. The absence of training, knowledge and experience has been accepted with various iterations of a fit to work scheme (DWP, 2002, 2003a, 2003b; Bevan, et al., 2007; Bevan, et al., 2009) having emerged including the current fit for work service (DWP, 2015a, 2015b, 2015c). The success of which has not yet been validated.

2.2.5. Occupational injuries and diseases

Musculoskeletal injuries caused or made worse by work are reported as a major reason for absence in the UK and worldwide (Rostykus, Ip, & Mallon, 2013). Yet a clear definition of *work-relatedness* and how these are objectively evaluated is not evident and use of this phrase may reinforce a belief that a high proportion of MSDs are within this category, and may not be representative of reality (Punnett & Wegman, 2004). Recognition that perception and reality may be somewhat different (Bartys, Burton, Wright, Mackay & Main, 2003) would assist employers and employees.

Some people may *feel* that being at work makes them worse – a person who does not like their work could easily state that the condition has been made *worse by work* and this could be a conscious or subconscious belief (Burton & Main, 2000). Alternatively, a person may genuinely perceive that work has made their condition worse when the reality could be somewhat different. Either way the evaluation of whether an illness is or is not work-related is complex and fraught with possible misunderstanding by the employee and their managers (Burton & Main, 2000), as highlighted in chapter 6, case 5 and 6. The suggestion by health and safety organisations and government statistics that work-related prevalence is high could misdirect appropriate control measures and not help reduce occupational risks. Regular reference to such terms creates a widespread belief that work and or certain tasks at work are bad for health when this may not be the case. Avoiding reference to the

possible implication of personal risk factors, and legal responsibility, fails to educate employees of the multiple factors and what preventative measures they can take.

The Health and Safety Executive (HSE, 2002) developed a strategy to address the scale of work-related MSDs following the evaluation of around 300 businesses and 2700 employees. The recommendations provide guidance inconsistent with psychosocial language and messaging:

- *Early treatment should be sought for back pain* - most episodes of simple mechanical low back pain are normal, not clinical and resolve without intervention;
- *Avoid manual handling and use lifting equipment where possible* - this strongly infers that manual handling is a causative factor when this is not necessarily the case.

Use of such language can create beliefs and fears about work (Waddell, Burton & Kendall, 2009) whilst the lack of guidance on how an individual may avoid or manage back pain with appropriate exercise and conditioning (Paul, Ribeiro, & Teixeira, 2012) fails to help reduce the risk to employees.

2.2.5.1. Employer's liability (EL)

Employers' are required to purchase this compulsory insurance (DWP, 2003c, 2003d) to provide a lump sum payment should an individual be injured or develop a disease which is caused by work. Attributing causation is easier when a specific incident has occurred which has led to an injury and potential claims are considered by a claims assessor to establish liability and decide compensation. Recent literature specifically relating to musculoskeletal EL claims was not identified and data which compares perceived work-relatedness and actual liability not apparent in academic or grey literature albeit that the latter may be commercially sensitive data.

2.3. Employee health benefits

The following is a summary of the benefits provided by the participating organisations and cross-referenced with the literature.

2.3.1. Private healthcare plans

These plans have now become an aid to recruitment and retention and often provided without any clear objective compared with the original intent of assisting a prompt return to work. Prevalence, incidence rates and costs tend to be commercially sensitive and not

published in the public domain and are confidential between the provider of the benefit and the client organisation as outlined in chapter 5. Occasionally organisations may provide data for a published benefit review but these are rare and information not always comparable.

Patient attitudes, beliefs and expectations also appear to be driving incidence of diagnostics (Malhotra, et al., 2015). Degenerative changes, disc bulges and disc protrusions may be evident on an MRI scan from the age of around 26 years but the presence of these conditions may not be associated with an individual's pain as these are also equally common in pain free subjects (Brinjikji, Luetmer & Comstock, 2015). Reliance on technology and the need to meet the demands of the patient led to an increase in procedures such as spinal fusions (Mafi, McCarthy, Davis & Landon, 2013) and disc replacements. Evidence has shown that these are not likely to resolve the problem (Mannion, Brox, & Fairbank, 2016) and in November 2016 were removed from the leading UK clinical guidelines (National Institute of Health and Care Excellence) as an effective treatment for low back pain (NICE, 2016). Treatment expectations and treatment seeking behaviours (Geisser, Roth & Williams, 2006), have also led to exponential increases in medication (both prescribed and over the counter) and steroid and other non-evidence based injections (Staal, de Bie, de Vet, Hildebrandt & Nelemans, 2009) some of which will also not be covered by the guidelines (NICE, 2016).

2.3.2. Private physiotherapy

Provision of access to benefits (e.g. physiotherapy) outside of a private healthcare plan (chapter 3) is common but incidence and cost are retained by the service provider and the client organisation as outlined in chapter 5. Direct access to private healthcare allows employees to access to treatment when experiencing an MSD. This type of service provision may encourage treatment seeking as part of a legitimisation of an illness (Main, Sullivan & Watson, 2008) and may result in unnecessary treatment as identified from the documents retrieved and analysed for chapter 6. Any commercially sensitive data are not provided in this thesis.

2.3.3. Group income protection (GIP) and incapacity

GIP and incapacity benefit (disability pension) are designed to pay benefit for employees who develop an illness or suffer an injury meaning they cannot work temporarily or permanently may encourage individuals to succumb to a belief that they should not work (Main, et al., 2008). Sometimes, this may arise because of work dissatisfaction or problems

with performance (Waddell, et al., 2009). Other individuals may have treatable condition but success is dependent on the person engaging actively in the treatment programme.

Reliance on the medical model may mean that the multifactorial issues are not identified, and addressed, resulting in a long-term claim which incurs unnecessary cost for the employer (and/or insurance company) and may result in disability that could have been avoided (Waddell & Aylward, 2005).

A prospective study, Hordaland Health Study Cohort of 18, 581, with a 7-year follow up, found that physical health-related quality of life using the Short Form (SF 12) questionnaire was a strong predictor of a disability pension due to an MSD (Haukenes, Farbu, Riise & Tell, 2014). This study identified that MSDs and mental health each accounted for one-third of disability diagnoses, so combined around 66% of all conditions. It considered a number of covariates including: heavy physical activity; smoking; height; weight; BMI; education; and occupation. The perception of a poorer physical health was the main predictor of a MSD related disability pension compared to the poorer self-perceived mental health.

Adjustments for lifestyle, socio-economic factors and pain sites attenuated the disability risk associated with poorer self-perceived physical risk but a strong association remained (Haukenes, et al., 2014). This study provides evidence of the scale of MSDs that is often not apparent in literature accessible to managers within organisations and outlines the multifactorial nature of such problems and the strong link to psychosocial factors.

2.3.4. Wellbeing

Wellbeing programmes provide advice and guidance via on-line or face-to-face assessment of an individual's health risks, and provide supporting materials, but reference to assessment and guidance on musculoskeletal health was not evident in the grey literature of three major UK wellbeing providers. A major contention with these programmes is that they tend to assess at a point in time and in general do not provide ongoing support or measure the effectiveness of the programme over a longer period. For many years they have struggled to demonstrate clear benefits for the employees and any associated business savings (Bolnick, et al., 2013). This is partly due to the complexities of having an accurate benchmark and the ability to measure the success or otherwise of any interventions and whether these are sustained over time. Integration of wellbeing and occupational risk should if measured, provide benefits, beyond that of a standalone wellbeing programme (Punnett, et al., 2009).

Wellbeing programmes also touch on *work life balance* and suggest that work can be harmful to physical and psychological health but rarely reflect on how they both can interact with each other positively as well as negatively (Waddell & Burton, 2006; Aylward, 2007).

2.3.5. Summary

This diverse approach to data collation and analysis means that the prevalence and cost of MSDs in the UK and potentially worldwide is actually unknown. The literature focuses on MSDs often with reference to specific conditions such as low back pain and literature (including grey literature) relating to musculoskeletal *health* was rare.

2.4. Occupational challenges and influences

The complexity of identifying and managing occupational musculoskeletal risks in the workplace is exacerbated by the multidimensional and uncoordinated approach governed by legislation and the interpretation of the law into occupational practice. It is thought that these issues will remain post Brexit as the UK interpretation of European legislation is part of the problem and as the transition to a UK version will need to replicate the current status for reasons of simplicity of transition.

2.4.1. Legislation, occupational exposure and compliance

In the UK, musculoskeletal health, ill health and injury are legislated by a number of different statutes and regulations including: The Health and Safety at Work Act, 1974; the Manual Handling Operations Regulations, 1992; the Working Time Directive, 1993 (as amended in 2003); the Management of Health and Safety Regulations, 1999; the Management Standards 2000 and the Equality Act 2010.

For employers, compliance with the above legislation is often the main priority in relation to the management of Occupational Health (Kloss, 2005). The purpose of the legislation is to ensure that both the employer and the employee understand their Duty of Care to protect from harm: employees (or themselves); colleagues (including contractors) and members of the public (Waddell, 2006).

Interpretation of any legislation is fraught with difficulty and legislation in practice ignores the implications of personal risk factors when assessing musculoskeletal risks. Guidance from the HSE and the Institute of Occupational Safety and Health (IOSH) omits any mention of the logic of assessing such factors albeit that they would argue that this is inherent in the array of statute, regulations and guidance if read in detail. The counter argument also

present in legislation is that associated with the Equality Act (2010) and the requirement not to discriminate on grounds of ill health. Those, who believe, that their employer is treating them unfairly, may invoke the Human Rights Act (1998). Interpretation across Health and Safety legislation and in particular the Equality Act is posited as one of the factors preventing employers considering the broader risks and helping the employee address them for their own health as well as their own safety.

2.4.2. On-employment assessments

New starter assessments to consider: fitness for purpose, compliance with the Equality Act and as a benchmark to measure whether any future exposure to the work is causing harm, are sometimes undertaken by employers. Assessment of musculoskeletal function within this process would be rare, other than in high-risk, safety critical, occupations (Waddell, 2006) and without such an assessment, employers would not have a benchmark of musculoskeletal function or fitness from which to measure any possible future work-relatedness (Hagberg, et al., 1995).

2.4.3. Risk assessment - type of work

From a legislative perspective there is no requirement to assess or measure the personal risks (e.g. function) or in practice, consider this is how the legislation is interpreted. The *Health and Safety* prescriptive legislation relating to the prevention of MSDs is the requirement to undertake a risk assessment of both physical and psychological risks and comply with the manual handling regulations.

The two key aspects of the HSE risk assessment process are:

1. Identification of the hazards;
2. Identification of who can be harmed and how.

Traditional risk assessments in most organisations will consider issues such as manual handling and will be thorough in assessing; the tasks; the number of times the task is undertaken by hour and per shift; the load both weight and ease of lifting, pulling and pushing and the safety of the load (HSE, 2015). This process should identify the likelihood and severity of harm per task or per job. If personal risks such as age, gender, overall fitness for purpose (including strength and conditioning), are ignored then the risk assessment is potentially flawed.

Occupational risks, for example: driving (Chen, et al., 2005); working at a desk (Buckley, et al., 2014) and sustaining any posture for any length of time (DOH, 2010; Buckley, et al.,

2015), should be considered with personal risks (e.g. weight and conditioning) and sleep; posture; type of footwear and hobbies (Chaitow & Delany, 2010). Combining physical and psychological workload with personal factors can increase the understanding of the likelihood and severity of a MSD (Sainio, et al., 2008) and risk of diseases such as osteoarthritis and limited mobility (Woolf & Pfleger, 2003).

A connection between manual work and poor lifestyle behaviours, including smoking and unhealthy diets was also found by Sainio et al. (2008) suggesting that such risks (Palmer, Syddall, Cooper, & Coggan, 2003) should be part of the risk assessment process. Whilst the number of health risks and the strength of association with restrictions at work has been identified by a number of authors (Boles, et al., 2004; Burton, 2005).

2.4.4. Manual handling

One of the main aspects of manual handling is either to eliminate the risk by removing the need to undertake the task or reduction of the risk by reducing the weight of the load, the number of times it needs to be lifted or increasing the number of people involved in the process (MHOR, 1992; HSE, 2016). Consideration of personal risk factors appear limited to: age, gender, existing health issues and if the job requires unusual capability, e.g. above average strength, agility, or height, where any physical weakness should be included in the risk assessment process (HSE, 2015). Evidence to identify whether the changes in public health and if physical fitness is below that when these guidelines were produced (HSCIC, 2015) which would affect the baseline (e.g. average strength) or whether managers are assessing individual's personal risk was not identified.

The MHOR stimulates the belief that manual handling and potentially other physical tasks are harmful, and that avoidance is the best risk reduction measure (Burton & Waddell, 2004). It suggests that providing the tasks are performed, as instructed, then the practice is safe, yet individuals still suffer MSDs, increasing the perception that manual handling is a form of work that causes ill health and injury. Although eliminating unnecessary risk is sensible, failure to mention how individuals can counteract the physical stressors placed on the body, (Nolan, O'Sullivan, Stephenson, O'Sullivan & Luccock, 2018) is potentially negligent. Integrating safe practices with personal responsibility and the need to be fit for the job may help reduce the risk and help employees understand how they can perform the work safely for more years if they wish or need to continue to work.

The prevalence of manual handling has decreased significantly over the last fifty years yet the incidence of manual handling injuries still account for over a third of all workplace

injuries and the levels of disability from MSDs has continued to rise (Waddell, 2004; O'Sullivan, Caneira, O'Keefe & O'Sullivan, 2016). Workers regularly involved in shift work (Caruso, Hitchcock, Dick, Russo & Schmitt, 2004; D'Agostin & Negro, 2014) and some form of manual handling appear to have an increased incidence, for example nurses (Trinkoff, Le, Geiger-Brown, Lipscomb & Long, 2006; Attarchi, Raeisi, Namvar & Golabad, 2014).

2.4.5. Psychological hazards

Physical stressors such as manual handling, driving, flying, shift work and sitting for long periods should include an assessment of the psychological stressors that can arise in these roles (Management of Health and Safety at Work Regulations, 1999; Approved Code of Practice and Guidance (L21), HSE, 2017). The Management Standards (HSE, 2000) require an organisation, as a minimum, to identify the psychological hazards and who can be harmed and how. The HSE website (2017) outlines the link between psychosocial factors and MSDs and provides advice on how to reduce the psychosocial factors. The information on this HSE page appears however to relate to the Management Standards (HSE,2000) on which workplace psychological hazards are most likely to cause harm (e.g.: demands; role; relationships; control; change and support) appearing to confuse the psychosocial factors (outlined in chapter 3) with psychological stressors, which are also relevant to MSD health.

2.5. Personal risks

Public health information clearly highlights the scale of the problem in relation to excess weight, inactivity, lack of strength and conditioning and poor nutrition and the specific impact on work attendance and presentism published by Boles, et al., (2004) and Pelletier, et al., (2004). Articles in clinical journals appear to have focused on the consideration of a single construct such as weight and a single condition (e.g. obesity and knee disorders or excess weight and pain) whilst articles in sports medicine publications may consider a broader range of possible covariates. More recently, authors are starting to suggest that the traditional approach is no longer sufficient and that the assessment and management processes need to consider the broader risks outlined in this thesis (O'Sullivan et al., 2016).

2.5.1. Age

The ageing population (Kinsella, & Velkoff, 2001) is a major issue for employers (Houses of Parliament, 2011) and there is little planning for the impact this may or is likely to have on the employee's ability to work in their normal duties. Any disability deemed to be associated with age appears to be accepted as if this is inevitable (British Society of Rehabilitation Medicine, 2004). Acceptance that as we age certain tasks are likely to

become more difficult (Hardman & Stensel, 2009) should be aligned with programmes that support employees in understanding whether they are ageing faster than their biological years and what they can do to attenuate this risk. Programmes that increase the type, frequency and intensity of exercises (Paul, et al., 2012) tailored to the needs of the individual, their work and their social life will help motivate employees to continue to remain active in the knowledge that this is beneficial to their health and slow the ageing process.

2.5.1.1. Age and degeneration

The process of degeneration from our mid-twenties is poorly understood by most people especially as it is complex and involves multiple causal mechanisms (Frontera, et al, 2000a; Kirkwood, 2011). From around the age of forty both muscle mass and strength begin to decline and continue to do so with advancing age hence age is a significant factor in the onset and reoccurrence of MSDs (Parkes, et al.2005; MacIntosh, Gardiner & McComas, 2006) and can vary by gender (Cooper, et al, 2011). Declines in skeletal muscle mitochondria are thought to play a major part in this process (Peterson, Johannsen & Ravussin, 2012). Oxidative stress that leads to damage by free radicals, lipid/protein damage and the reduction in antioxidant defences is a consequence. Exercise and nutrition modification to limit the oxidative damage can slow the ageing process (Crespo & Williams, 2009, pp 93; Buonocore, Rucci, Vandoni, Negro & Marzatico, 2011; Dorla, Buonocore, Focarelli & Marzatico, 2012) and improve outcomes, including low back pain (Hayden, van Tulder & Tomlinson, 2005; Hayden, van Tulder, Malmivaara & Koes, 2005).

It is suggested that after the sixth decade the decline is circa 1-2% per year (Vandervoort, 2002) but that physiological adaptations can occur with appropriate exercise (Blair, Cheng & Holder, 2001; Brinjikji, et al., 2015). The ageing workforce is of increasing concern to many employers as over the next fifteen years nearly a quarter of the UK population will be over 65 and individuals are now spending on average seven more years at work than they were in the 1970's (Houses of Parliament, 2011). From a psychological perspective possible ignorance of the ageing process is probably beneficial as confronting such facts may be depressing whilst the concept of having to work to such an age with an MSD could become distressing.

2.5.1.2. Age and clinical conditions

Clinicians may suggest that an MSD is due to our age, when they cannot find any other causation (Waddell, 2004). Clinicians also use terminology which can easily be

misunderstood and may in fact cause harm (Sandow, 1916; Kendall et al., 1997). A common diagnosis provided to patients with low back pain is *degenerative disc disease* (DDD). Patients provided with this diagnosis perceive this, to be a significant illness, (Jam, 2014; Brinijikj et al., 2014) that increases in severity (*degenerative*). They may believe this *disease* to be serious and interpret that it is long term and possibly untreatable (O'Sullivan, et al., 2016). Simple reframing of a message into language understandable language to the individual (Butow & Sharpe, 2013) is an integral part of cognitive behavioural therapy and psychosocial research.

2.5.1.3. Biological, actual and perceived age

Exercise and weight management (Vincent, Raiser & Vincent, 2012; Wroblewski, et al., 2015) can slow the process of skeletal muscle ageing, significantly. Such research is extremely motivational and likely to encourage people to exercise and keep active (Bass & Caro, 2001). The alternative is they believe that with increasing years *they need to take it easy* because of their DDD or “crumbling spine” and that “there is nothing that can be done for them” all terms that stimulate fear avoidance of exercise (Bunzl, Watkins, Smith, Schutze & O'Sullivan, 2013). Perceived age, a construct of psychosocial attitudes and beliefs, can also adversely affect biological ageing (Christenson, et al., 2009).

The fundamental principles of the research by Wroblewski, et al., (2015) is that the loss of lean muscle mass experienced as part of the ageing process and the subjective and objective weakness experienced by sedentary aging, is modifiable. This knowledge should be integral to public health materials, safety information and provided by practitioners to their patients. Whether a person chooses to take action is a personal decision but the visual impact of an MRI scan of what happens if exercise is not maintained may encourage more people to be active, and result in personal, societal and economic improvements.

2.5.1.4. Age and weight

Weight management becomes more difficult as we age due to physiological changes (Roubenoff, 2009) and often inactivity (Stamatakis & Hamer, 2011) and this can lead to reduced mobility which in turn leads to further inactivity and increases in weight (Hergengoeder, Wert, Studenski & Brach, 2011). Obesity and inactivity can escalate the progress of degeneration (Villareal, et al., 2011; Vincent, et al., 2012). Reducing weight and increasing activity can improve physical function more than either intervention alone as otherwise there is a relative decline in muscle mass and strength concurrent with elevations in fat mass (Vincent, et al., 2012). Such evidence suggests that the combination

of weight management and activity should be an integral part of MSD “treatment” to improve function and mobility in obese adults and older adults. If individuals understood that they could reduce their risk of loss of independence and improve quality of life, then this may be sufficient knowledge to aid activation and to satisfy the desire to *stay younger for longer*.

2.5.1.5. Age and attitude

Psychosocial factors are a significant factor in ageing and MSDs in that they can predict disability (Haukerns, et al., 2014). They are also significant in relation to taking personal ownership and responsibility (Jinks, Nio Ong, & O’Neill, 2010) and can encourage people to maintain activity and be less reliant on both the health and the social system.

2.5.2. Function

Public health information provides little information on how our skeletal muscle system operates or what is important to the maintenance of musculoskeletal health (Hardman & Stensel, 2009). The human body as *a machine for the performance of work* has its foundations in three areas of study: biomechanics; musculoskeletal anatomy and neuromuscular physiology (Hamilton, Weimar & Luttgens, 2012). Understanding structure including basic biomechanics and the foundations of human movement, functional anatomy and human motion (Hamilton, et al., 2012) may help individuals understand why they need to keep active and maintain good muscle tone (MacIntosh, Gardiner & McComas, 2006; Hamill & Knutzen, 2009). This may also aid with their ability to reflect on the importance of core conditioning (Chek, 2011) and the physiological links between muscles, muscle contractions (MacIntosh, et al., 2006) tendons; nerves and the neuromuscular connection (MacIntosh, et al., 2006; Kilmer & Aitkens, 2009); soft tissue, blood flow (Guyton & Hall, 2000) and the importance of nutrition (Wackerhage & Rennie, 2006).

Biological changes occur with activity and inactivity (Fielding & Bean, 2006, pp 3; MacIntosh, et al., 2006) which are not understood. Clinical treatment tends to focus on addressing symptoms whereas sports medicine and rehabilitation will consider adaptations from exercise over the longer-term to address dysfunction (Hoffman, 2009; MacIntosh, et al., 2006); strength (Harris & Watkins, 2009, pp 24) injury, repair and fatigue (MacIntosh, et al., 2006). Maintaining flexibility is also an important aspect of function (Krivickas, 2006, pp 33) as we age (Birdee, et al, 2008; Bean & Pu, 2009, pp 311).

2.5.3. Inactivity

To understand inactivity, it is necessary to highlight the variance between activity and exercise, strength and conditioning and physical fitness as they describe different concepts and are often confused as being the same (Casperson, Powell & Christenson, 1985).

Public health publications may vary in what they measure making comparison sometimes complex but significant variances exist. The UK Government guidelines suggest 150 minutes per week of moderate-intensity aerobic physical activity or 75 minutes per week of vigorous-intensity or a combination thereof, suggesting that further health benefits could be achieved if the time spent undertaking activity is double that of the minimum so 300 and 150 minute respectively (WHO, 2012). Strength and conditioning training such as lifting weights, using body weight or participating in exercise such as yoga (Birdee, et al., 2008) is a recommended activity twice per week.

Inactivity is said to cost the European economy (EU 28) the equivalent of 70 billion GBP per annum and has crudely been projected to rise to circa 126 billion GBP by 2030 (ISCA/Cebr, 2015). Yet confusion can exist in relation to what constitutes inactivity (Casperson, Powell & Christenson, 1985).

2.5.3.1. Incidence and consequences

Public Health England (2016) suggest that 25% of women and 20% of men are physically inactive. The British Heart Foundation reported: 66% of men and 53% of women met the guidelines (BHF, 2015) and the Health and Social Care Information Centre (2015) reported: 76% of men and 63% of women met the guidelines in the highest income quintile with this falling to 55% and 47% respectively in the lower income quintile. The United Kingdom (UK) was found to be the most inactive European country when compared with Italy, Spain, France, Germany, and Poland in the International Sports and Culture Association (ISCA) and Centre for Economic Business Research (Cebr) report (2015). This publication also stated that 37% of the UK adult population were categorised as insufficiently active with 42% of females and 32% of males failing to meet the UK Governments' recommended minimum guidelines of physical activity. The multiple variants in the measurements underline the complexity of understanding the scale of the problem accepting that most of the data are based on subjective reporting and that the actual levels are uncertain.

The level of inactivity in the UK has been estimated to be responsible for 16.9% of deaths or around 92,000 people in 2012 and 37,000 premature deaths (NICE, 2015). The economic cost to the UK is estimated at 1.7 billion GBP of direct healthcare costs and 8.2

billion GBP from the indirect cost of inactivity (ISCA/Cebr, 2015) from four major physical disorders (colorectal and breast cancers, coronary heart disease and type two diabetes) excluding MSDs which were not considered. The link with mental health accounts for a further 2.5 billion GBP. The total cost of inactivity in the UK for these five conditions is 12.4 billion GBP per annum and circa 8.3% of UK health spending. Excluding MSDs and other conditions not mentioned, the burden of inactivity to the UK disease profile is around 40% higher than Europe from 2008 data sources (ISCA/Cebr, 2015).

The World Health Organisation suggest that twenty-five percent of adults and eighty percent of adolescents are insufficiently active (WHO, 2015). These levels of inactivity now account for over 500,000 deaths per year and ranked the fourth-leading risk factor for all global deaths according to the Centre for Economics and Business Research (2015).

Inactivity is often significantly associated with other risk factors including excess weight and poor nutrition (Lee, et al, 2013). Yet the NICE guidelines (2015) do not list improvements in musculoskeletal health as a benefit of increasing activity with the exception of reducing fractures and falls in the over 65 age group. Exercise is a recommended intervention for low back pain (Mortimer, Pernold & Wiktorin, 2006; NICE, 2016) but exactly what is defined as exercise and who is competent to prescribe exercise unclear, hence it is assumed by physiotherapists that these guidelines refer to the level of exercise knowledge that is within the skill of most physiotherapists (CSP, 2016).

2.5.3.2. Strength and conditioning

Public Health England (2016) found that only 24% of women and 34% men, aged 16 or over, undertake muscle-strengthening exercises. The HSCIC (2015) also found that 56% of women and 49% of men did not meet the strength and conditioning guidelines whilst only 23% of women and 33% of men met the combined aerobic and strength and conditioning guidelines (based on 2012 Health Survey for England data).

The Government's Health and Social Care guidance, (HSCIC, 2015) combines aerobic activity and muscle-strengthening activity. This indicates clearly the need to establish muscular and bone fitness through a combination of both aerobic and weight bearing exercise. The frequency, intensity and time per session is prescribed in relation to aerobic activity but guidance on strength and conditioning activities, is limited to a reference of twice per week whilst duration and intensity is omitted. The NHS guidelines are more specific and suggest that the exercises should involve all of the major muscle groups, with 8-12 repetitions per set, and the aim of completing at least one set to the point of

exhaustion. Suitable exercise for maintaining and improving musculoskeletal strength and flexibility would include the use of body weight, free weights or an ancient practice such as Yoga, Tai Chi, and Chi Gong (Birdee, et al., 2008) as sometimes recommended by orthopaedic physicians and surgeons but the frequency of which is unknown.

In a systematic review of exercise training interventions, comparing activity based interventions, strength and conditioning exercises and studies that used a combination of interventions, all fourteen studies reported an increase in muscle strength in obese adults during weight loss (Miller, et al., 2013) suggesting that various forms of exercise can improve muscle strength.

The lack of clarity on definitions relating to activity and exercise including a clear understanding of frequency, intensity and duration of activity would suggest that any data based on subjective reporting would indicate a higher compliance than any objective measure such as that which may be assessed by technology (e.g. a wearable GPS device).

2.5.3.3. Preventative and therapeutic value

The level of physical activity in childhood is a determinant of good musculoskeletal health in adulthood. A study of 5-17 year-old children and young people identified that as individuals' age they become more inactive, and starting to exercise at an older age becomes more difficult as demands on time increase (ISCA/Cebr, 2015). Regular moderate and vigorous activity is essential to the development of a strong foundation for skeletal muscle health but physical activity levels in children have decreased in the last ten years.

The impact of physical activity (e.g. running and weight lifting), thought to have a negative impact on the musculoskeletal system, has been reconsidered. The risk of degenerative changes as we age and the loss of muscle mass and muscle fitness that can increase the level of dependence in the elderly appears to be one of the drivers for change (Warburton, Nicol & Bredin, 2008; Vincent, et al., 2012). Studies have revealed people with higher level of muscle strength have fewer functional limitations and lower incidence of chronic disease which has helped inform of the broader benefits of exercise.

Physical inactivity and its association with chronic MSDs was found in a longitudinal study, of 47,556 adults over 11 years, by Holth, Werpen, Zwart and Hagen (2008). In this study 51% of those followed up (39,250 who responded to questions about physical exercise) reported chronic musculoskeletal complaints and 2,318 reported widespread problems, suggesting that inactivity is closely linked to musculoskeletal pain and or dysfunction and that this may or may not be associated with weight. The authors recommended that future

studies need to consider whether the MSD is a cause or a consequence of inactivity. The cases identified in this thesis suggest that inactivity can be both but of those documented it appears to be a consequence in most cases (chapter 5 & 6).

Inactivity was also significant in a study of 1111 patients with osteoarthritis (OA) of the knee. The findings were that 40.1% of men and 56.5% of women were inactive doing no moderate to vigorous activity over seven days. The percentage of men and women achieving the recommended guidelines reduced over the period of the study (Dunlop, et al., 2011). Yet exercise has been reported to provide substantial health benefits to individuals with osteoarthritis (Iversen, Laing & Finckh, 2009, pp 157) combined with other conservative options (Brandt, 2004).

High activity may also be a risk factor (Shiri, et al., 2007) but this may be associated with individual issues associated with function and inappropriate training rather than a simple direct link between high activity and an MSD. Further research is required in this area.

Sedentary lifestyles that can lead to obesity (Buckley, et al., 2014; Smith, et al., 2015; Better Health and Work Alliance, 2017) or be inherent in the behaviour of obese and older adults may also contribute to skeletal muscle dysfunction and fat accumulation between tissues and within the muscle itself. This process can also lead to various inflammatory environments and the progression of muscle atrophy and sarcopenia (Vincent, et al., 2012). As public health faces an ageing population with a declining physical health status it is difficult to understand why the medical model does not consider excess weight and inactivity as we age when this underutilisation of our physical selves can lead to such significant effect on health and the consequential reliance on greater healthcare expenditure and care (Burks & Cohn, 2011). Although evidence exists that strength and aerobic activity can, actually attenuate and even reverse ageing musculoskeletal conditions, such as sarcopenia, only a small percentage of the older population take regular exercise (Burks & Cohn, 2011; Vincent, et al., 2012). This may be due to a lack of awareness, associated possibly with fewer opportunities, variances between partners' likes and dislikes combined with a perception that it is more difficult and a belief it may cause harm.

Increasing activity levels could save the UK, from direct and indirect costs, 2.4 billion GBP per annum (ISCA/Cebr, 2015). Exercise can be used to treat musculoskeletal conditions (including back pain) to:

1. Address biomechanical problems (Fielding & Bean, 2009);

2. Improve strength (Harris & Watkins, 2009) and flexibility, (Rainville, Hartiganm Martinez, Limke, Jouve & Finno, 2004; Krivackas, 2009);
3. Improve musculoskeletal fitness (Warburton, et al., 2008);
4. Reduce inflammatory problems such as osteoarthritis, (Iversen, et al., 2009; Roubenoff, 2009, pp 265);
5. Reduce neuromuscular diseases (Kilmer & Aitkens, 2009, pp 180);
6. Assist ageing (Vincent, et al., 2012);
7. Reduce the burden on the NHS and the social care system.

The relationship between MSDs and activity has unfortunately been ignored in a number of studies (Allender, Foster, Scarborough & Rayner, 2007) but why this is the case is unclear.

2.5.4. Mental exercise

Sometimes known as cognitive training or brain training are those that suggest that cognitive abilities can be maintained by exercising the brain in a similar way to physical exercise. The benefits of which is the reduction in the risk of illness such as dementia, yet the term is rarely used in the literature. Whilst physical exercise can benefit psychological health, mental exercise can improve physical wellbeing and support active engagement in a range of preventative strategies and self-help techniques when pain, dysfunction or injury arises (WHO, 2006). Mental health should not be separated from physical health.

2.5.5. Excess weight

Data on excess weight and obesity are mostly collated, in national statistics and in this research, from subjective reporting. The standard measure of weight divided by height, commonly referred to as Body Mass Index (BMI) has been used following the general guidelines (NICE, 2014) of: underweight < BMI 18 kg/m²; normal weight BMI 18-25 kg/m²; overweight BMI 25-29 kg/m² and obese BMI >30 kg/m². Flaws exist with this measurement in that a person who has good muscle mass (e.g. an athlete) can weigh more and may be classified into as overweight or obese category when this is not the case as their percentage of body fat could be low. The use of height to waist ratio is an indicator of storage of body fat but is more difficult to ascertain from telephone conversations, as many individuals do not know their measurements.

A House of Commons Briefing Paper (Barker, 2017) reported that 27% of adults in England are obese, which rates similar for men and women (compared to 13.2% for men and 16.4%

for women in 1993) and a further 36% are overweight. The highest rate of excess weight is in the North East with the lowest being in London. The obesity rate in Wales is higher in women than men although more Welsh men are overweight or obese (63%) compared to women (56%). In Scotland 67% of people are overweight or obese and of these 28% are obese. Women are more likely to be obese (30%) compared to men (29%).

2.5.5.1. Excess weight and height to waist

Waist circumference figures, which place people at high risk of serious illness, were reported as: 44% of women and 34% of men with a very high waist ratio Table 5.

Table 5: NICE obesity categories based on combined BMI and waist circumference

BMI classification	Waist circumference		
	Low	High	Very high
Normal weight (18.5 to < 25 kg/m ²)	No increased risk	No increased risk	Increased risk
Overweight (25 to < 30 kg/m ²)	No increased risk	Increased risk	High risk
Obesity I (30 to < 35 kg/m ²)	Increased risk	High risk	Very high risk
Obesity II (35 to <40 kg/m ²)	Very high risk	Very high risk	Very high risk
Obesity III (40 kg/m ² or more)	Very high risk	Very high risk	Very high risk

2.5.5.2. Excess weight and chronicity

Evidence to suggest that excess weight is considered in relation to management of MSDs in clinical practice was not identified in this research. The exception was certain chronic cases where, without weight reduction, the excess load will contribute to ongoing pain levels, in osteoarthritis of the knee (Somers, et al., 2012; Verbeek et al., 2017) and of the hip (Paans, van den Akker-Scheek, van der Meer, Bulstra & Stevens, 2009). Addressing weight at this stage is more difficult, the excess load is likely to have exacerbated the degenerative process, and hence the level of pain and severity of condition possibly could have been reduced if identified and managed earlier.

One of the issues facing clinical practice is the evidence that suggests that there is no causal link between excess weight or obesity and conditions such as low back pain (Woolf & Pleger, 2003). A literature review of Medline articles by Mirtz and Greene, (2005) between 1990 and 2004, to identify any link between BMI and low back pain, found that there was a lack of clear dose-response evidence between these two factors, but a wide variance in results across studies. Research, which aims to identify a direct causal linear relationship between pain and a construct such as weight is missing a fundamental aspect of a MSD.

The presence of a condition on an MRI scan (Guermazi et al., 2012; Brinijikji et al., 2014; Nakashima, 2015) is similar in individuals with and without a declaration of pain and therefore researchers should not expect there to be a direct link with any other singular presentation of the possible multiple causation of MSDs. Instead, research should focus on the risk of the additional load on the skeletal system and the relationship to the rate of degeneration, (Hardy, et al., 2013) in the knowledge that prevalence is higher in those who are overweight and even greater in the obese population (Anandacoomarasamy, Caterson, Sambrook, Fransen & March, 2008).

2.5.5.3. Excess weight and link to inactivity

Weight gain is a significant determinant of future inactivity and sedentary behaviour as found in a longitudinal analysis of the EPIC- Norfolk cohort of 77,630 participants and 30,445 respondents to a questionnaire over 10 years (Golubic, et al., 2013). Increase in weight can lead to less activity, which leads to further increases in weight. A higher BMI and negative links with muscle strength and physical performance in older adults was identified in cross sectional data from eight UK cohort studies (n=16,444) with an age range of 50-90 years (Hardy, et al., 2013). It would be prudent, for adults to reduce body fat, maintain weight at a reasonable level to reduce lumbar problems (Shiri, et al., 2007) the additional load on bones and joints, (Anandacoomarasamy, et al., 2008) and increase muscle strength, to assist in maintaining mobility for longer (Makk, 2007).

2.5.5.4. Excess weight and children

The impact of obesity on the growing musculoskeletal system (AAOS, 2006 Chan & Chen, 2015) is of considerable concern as it suggests that the prevalence of MSDs is likely to continue to rise. Behaviours that are established as a young person are more difficult to change in later life and thus the potential risk of substantial increases in pain, dysfunction and ultimate mobility issues (Hergenroeder, et al., 2011) and the burden this has on the social system are likely to escalate considerably. Educating parents about the potential risk of excess weight on the musculoskeletal system may help reduce the risk to their children and may be the motivation for behavioural change in parents.

2.5.6. Nutrition

Poor nutrition remains a major problem with households of all incomes falling well below Government nutritional guidelines in England, Scotland, Wales and North Ireland (HSCIC, 2015). Yet, there appears to be a disconnect between such knowledge and clinical practice in the assessment and treatment of MSDs (Woolf & Pleger, 2003; O'Sullivan, et al., 2016).

Although for the purpose of this thesis, nutrition is out of scope due to the complexity in collecting accurate data and discussion around the possible links with MSDs including osteoporosis (Shah, 2017) it is apparent from the search criteria that this is not a leading area of research. Good health and good nutrition are closely linked (CDC, 2015) and logic would suggest that the skeletal muscle system needs the appropriate nutrients to be maintained (Woolf, 2007; Annesi, 2012). Sports medicine practitioners: British Association of Sports and Exercise Medicine, 2017; National Association of Sports Medicine, 2017 and nutritionists (British Nutrition Foundation, 2017) are at the forefront of understanding the link (Thomas, Erdman, & Burke 2016). This has been evident in the last three Olympic Games and the success of our athletes (Killer, 2017) in other events including cycling and especially the Tour de France (Mitchell, 2017).

Poor nutrition is linked to a number of other illnesses and the presence of these conditions may affect the musculoskeletal system, for example uncontrolled diabetes (Diabetes UK, 2017). Conversely, good nutrition can support activity, exercise, weight maintenance and overall musculoskeletal health (Annesi, 2012) to the intrinsic link with overall health.

2.6. Conclusion

The “silo” approach to the identification and management of musculoskeletal health, ill health and injury from a public health perspective has been reflected in the workplace. Reliance on subjective data from limited sources and devolved responsibility for safety, wellbeing and health with no overarching strategy or data collection has disguised the true extent of the scale of the problem.

The legislative guidance has focused on occupational risks but failed to consider the personal risks as evident from public health and the scale of excess weight, obesity, inactivity and poor nutrition that can impact on work productivity (Burton et al., 2005). Instead, wellbeing has become the “hopeful” solution to the problem. From a musculoskeletal perspective the assessment of musculoskeletal health and the provision of health education to improve or maintain good musculoskeletal health is somewhat missing (chapters 5 & 6). Consideration of factors such as excess weight and inactivity, by clinicians is often limited (chapter 8), to very high-risk patients with chronic diseases e.g. diabetes and cardiovascular problems (Winzenberg, Reid & Shaw, 2009; Woolf, 2012) rather than musculoskeletal patients. Although psychosocial factors are now mentioned more frequently it was evident that following the publication of many research articles on the importance of understanding these potential obstacles to recovery, that these were not

understood by practitioners (Spine, 2005; Waddell, 2006). The latest recommendations for the management of low back pain (NICE, 2016) clearly indicate that such factors are integral to the most appropriate clinical care pathway. Translating how to address these issues remains a problem not generally discussed in literature or as observed in practice from the data outlined in chapters 6 and 8.

Exclusion of these factors may arise from reliance on the assessment and treatment of MSDs being based on the medical model of care (Waddell, 2004) whilst many individuals who present with a musculoskeletal condition do not have any disease or serious injury (Waddell, 2006). The link between MSDs, psychological (Engel, 1980) and social determinants (Dahlgren and Whitehead, 1991) has long been recognised (Lederman, 2010) but is complex and intrinsically integral to individual behaviours inherent to the management of personal risks (O'Sullivan, et al., 2016).

Clinical practitioners have little training or experience in either the assessment and management of occupational and/or personal risks that affect their patients. Non-clinical practitioners such as sports medicine professionals although more competent in aspects such weight management and exercise would lack clinical and occupational skills.

Chapter 3 reviews the most common interventions provided by clinicians and sports exercise professionals in the management of musculoskeletal health or address ill health and injury. This includes the biopsychosocial model (pages 67 -70) intended to be an integrated physical, psychological and social approach, but currently weighted to the psychosocial issues in the common programmes offered (pages 70-72). Whilst these are important and many modifiable, focus on psychosocial factors in isolation, are unlikely to resolve the range of multifactorial problems and may ignore some significant risks. Dismissal of any physical reasons for pain could be a concern to the patient and may become an obstacle to their recovery.

Chapter 3

Intervention Strategies

3. Introduction

Chapter 2 considered the occupational and personal risk factors associated with MSDs and the various constructs or phenomena that may influence these risks. This chapter explores the common intervention strategies, outlined in the literature, proffered by organisations and inherent within the state funded system or the provision of access to support from the private sector. It is structured to address: the information available on preventing musculoskeletal ill health; the occupational and societal reliance on the medical model; the clinical assessment process and the treatments that emerge to address the physical, psychological and social aspects of MSDs.

Issues associated with both the external and internal locus of control and how the interaction between these potentially underpin both incidence and severity are explored. It is suggested that understanding how we as human beings view the world may foster a more tailored and holistic approach to the prevention, assessment and management of musculoskeletal health and ill health.

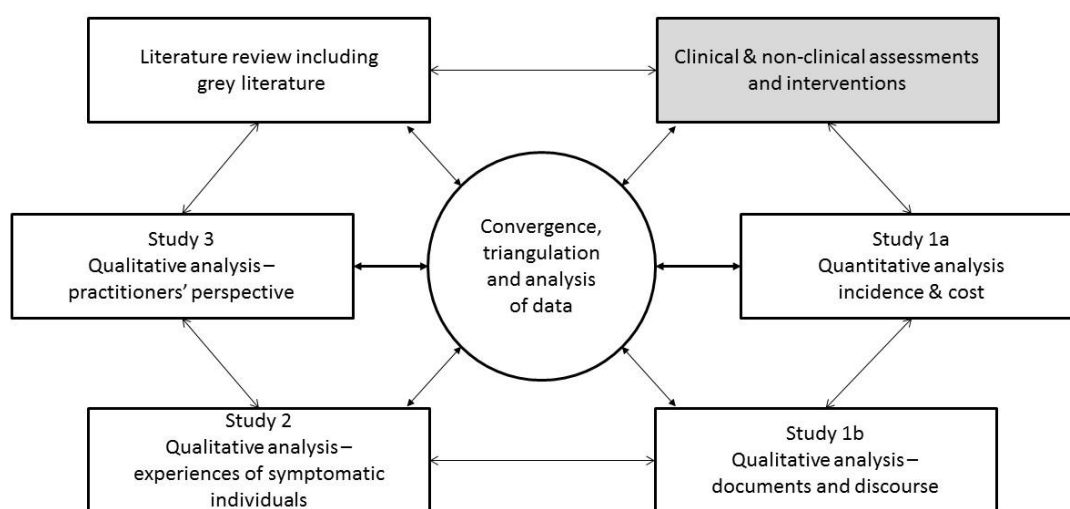


Figure 3: Explanatory sequential mixed methods research design – Phase 2

3.1. Prevention strategies

Any risk management strategy should always aim to prevent the risk (incidence) and limit the severity of any occurrence. The medical model seems to accept that once a person suffers a condition such as low back pain that a reoccurrence is almost inevitable and suggests that a person should be educated to manage “flare-ups” of their pain or their dysfunction. Whether from a psychological perspective, this is the correct approach, is a subject for debate. The potential for risk reduction also appears to be absent in health, safety and wellbeing strategies as discussed below.

3.1.1. Prevention is better than cure

The burden of MSDs across Europe, has long been recognised (Woolf & Pfleger, 2003; Bevan, et al., 2009) yet strategies to address the impact to individuals, employers and society via active prevention and non-clinical self-help interventions are rare. The focus in the literature is associated mainly with MSDs rather than musculoskeletal health (Jevne, 2016). In 2006, Anthony Woolf and The European Union of Medical Specialists Section of Rheumatology recommended the following strategies for the whole population:

Box 1: Maintenance of bone and joint health

Strategies for good health
<ul style="list-style-type: none">• Physical activity to maintain physical fitness• Maintaining an ideal weight• A balanced diet that meets the recommended daily allowance for calcium and vitamin D• The avoidance of smoking• The balanced use of alcohol and avoidance of alcohol misuse• The promotion of accident prevention programmes for the avoidance of musculoskeletal injuries• Health promotion in the workplace to include the need for functional fitness for sport activities to reduce the risk of overuse injuries (doing too much too soon)• Greater public and individual awareness of the problems that relate to the musculoskeletal system. Good quality information on how to prevent, early assess or effectively manage the conditions. These measures will improve the musculoskeletal health of the population and have many other health benefits.

(Adapted from Woolf, 2006)

This simple framework for the prevention of musculoskeletal ill health/injury is consistent with the recommendations of Eugene Sandow, outlined in his book *Life is Movement* (1920). Adaptation of the above to provide more specific advice to address the physical and psychological stressors of life whether work or social (external locus of control) and the importance of self-responsibility (internal locus of control) to reduce the risk of ill health and injury, would provide a foundation for a musculoskeletal wellbeing programme.

Regular activity is key to the prevention or risk reduction of MSDs (Joy, Blair & Sallis, 2012) and combined with maintaining weight at an ideal level, good nutrition and a positive attitude towards musculoskeletal health and self-help, should provide the four cornerstones of a musculoskeletal wellbeing programme, and be inherent in a treatment programme to reduce future risks.

3.1.2. Safety related prevention

Advice relating to musculoskeletal health, does not appear in general health, safety or wellbeing literature as evident from the information on websites and publications from the Health and Safety Executive (HSE) or the Institute of Occupational Safety and Health (IOSH). Instead the promotion of avoidance behaviour as a preventative strategy arguably infers, that the different forms of moving and handling used at work are likely to cause harm (HSE, 2015) from the strain or posture adopted (Nolan, O'Sullivan, Stephenson, O'Sullivan & Lucock, 2018). The original intent of reducing the activities thought to cause injury (MHOR, 1992), was an appropriate risk management strategy but was neither adapted to the changing musculoskeletal health risks of the population nor considered in regard to the potential unintended consequences of organisational, individual and societal interpretation.

Messaging which promotes early intervention when an MSD arises may in certain cases, prevent chronicity (Breen, et al., 2005) but may also inadvertently, be perceived that a clinical treatment is required to achieve recovery when the condition will resolve with little or no intervention. Thus employees and the public require information which directs individuals when to seek help and when self-help is appropriate.

3.1.3. A sports perspective

Sport and sports medicine have a different approach to manual handling, which includes lifting heavy loads as an Olympic sport yet the concept of functional training to lift loads and the associated fitness required, including psychological fitness and nutritional fuelling are not integral to manual handling training in the workplace. Thus avoiding a critical element of manual work, that is associated with the age, gender, strength and conditioning and overall fitness and health of the individual to perform such tasks.

3.1.4. Changes in physiological advancements

More recent research associated with connective tissue and how the fascia may become stiff and inflexible, due to varying levels of mechanical stress, (Findley, Dhaudhry, Stecco &

Roman, 2012), has emerged in literature in recent years (Chaitow, 2008; Purslow, 2010; Day, Copetti, & Rucli, 2011). This is deepening our understanding of the interconnectivity of the skeletal muscle system and possible involvement of connective tissue in MSDs (Chaitow, 2012). Research relating to biological adaptations including consideration that architectural principles of tensegrity can be applied to biological (biotensegrity) functions (Turvey, 2007; Swanson, 2013) may also aid further insight into the biological architecture of the human body and the potential links to furthering knowledge in relation to the biomechanical and structural aspects of MSDs. A range of other physiological changes may occur and may relate to musculoskeletal health e.g. psychosocial stressors; toxicity; infections; genetics and other inflammatory markers (Chaitow, 2008) and degrading gene variants (Omair, Holden, Reikeras & Brox, 2013) but for the purpose of this thesis will not be discussed in any detail.

The central nervous system (CNS) is plastic in nature and there may be neurophysiological changes over time with the development of chronic pain. Pain signals are constantly modulated, within the CNS, (Moseley, 2012; Moseley, & Butler, 2015) before they reach consciousness (Arnand & Craig, 1996). The result is that our brain may be interpreting a message that may be inconsistent with the extent of the injury, but that interpretation triggers a belief that may be difficult to change.

Continuing improvement in our knowledge of our physical selves, whilst not ignoring the psychological or philosophical aspects, (Burton, 2005) may aid the understanding of how the risk of MSDs may be reduced, and information then used in wellbeing programmes. It may also explain why the biomechanical model as practised by physiotherapists and orthopaedic practitioners is deemed by some to have failed (Swanson, 2013).

3.1.5. The wellbeing approach

Corporate wellbeing programmes to promote and assist employees in maintaining health neglect to provide practical information on musculoskeletal health or assess musculoskeletal risks. Instead, some major providers of wellbeing programmes, ignore advice on how to maintain or gain good musculoskeletal health and actively encourage early clinical interventions, for any form of MSD. Therefore, rather than promoting self-management, they believe that *great healthcare is prompt healthcare* which tends to somewhat contradict the purpose of wellbeing. Although this positioning is proffered by organisations that gain commercially from such suggestions, it is possible that their

approach is not due to financial drivers but more a lack of understanding on what should be done differently.

[Due to commercial sensitivity, the source of the information outlined in the two paragraphs above, has not been referenced].

3.2. Management strategies

Many of the common employee health related services provided in organisations (chapter 2) or individual access to intervention methodologies, rely to a greater or lesser degree, on the medical model, as the traditional approach to the provision of healthcare for musculoskeletal conditions (Waddell, 2004).

3.2.1. Sickness absence - external influences

This commences with the need for an employee to visit his/her GP to obtain a *fit note* after 7 days of absence. A GP often has limited time and knowledge on how to assess and treat MSDs (Breen, Austin, Campion-Smith, Carr, & Mann, 2007) relying on referrals to other NHS and private practitioners. Ongoing absence requires further certification from the individuals GP.

3.2.2. Occupational health

Access to the traditional occupational health (OH) service whether internal or externally provided normally involves assessment and recommendations by OH nurses and physicians with referrals to other clinical resources where they deem appropriate.

3.2.3. Private healthcare

Provision of private healthcare benefits either rely on the GP referral or allow direct access to a triage service. The private healthcare model whether direct pay or via an insurance policy or similar follows standard clinical care pathways. Access to non-clinical options are normally excluded or strictly limited within healthcare plans (Main, Sullivan, & Watson, 2008) thus the private healthcare benefit actively promotes medicalisation of the problem when the problem may simply be a normal presentation of use of the musculoskeletal system.

The provision of benefits, which provide access to diagnostics and treatment, is intended to maintain or return a person at work to work earlier than may otherwise have been the case. Perceptions by the public that prompt treatment is required to achieve a recovery as suggested by reports such as the Chartered Society of Physiotherapy (2012, 2016a) has

driven an increase in incidence in both the NHS and the private sector. This appears to be media driven including publication of dissatisfaction with the NHS (Kings Fund, 2017) from circa 40% of the population under age 75, due to: long waiting times (CSP, 2016a); staff shortages (NHS, 2017) and lack of funding as published in the Economist (January, 2017) following an interview with Philip Hammond (Chancellor of the Exchequer).

3.2.4. Income protection (IP) and incapacity benefits

Income protection provision for an early ill health retirement income, provide security to employees of ongoing income in the case of illness or injury. The security of compensation for ill health for employees who are unhappy in their work (or tempted by financial gain) may inadvertently be an obstacle to recovery (Main et al, 1997; Nicholas, Linton, Watson & Main, 2011).

3.2.5. The medical model and clinical alternatives

The medical model currently drives the assessment (Petty & Moore, 2002) and treatment processes for MSDs across the western world. Traditionally medicine operated within a more holistic framework as is evident from history and the roots of osteopathy and chiropractic practice (Waddell, 2004) but modern musculoskeletal medicine has focused on the biomechanical issues.

The dominant model of disease today is biomedical, and it leaves no room within its framework for the social, psychological, and behavioral dimensions of illness. A biopsychosocial model is proposed that provides a blueprint for research, a framework for teaching, and a design for action in the real world of health care (George Engel, 1977).

The development of this and other integrated models has yet to evolve a more holistic understanding.

3.3. The philosophical perspective

Since the ancient Greeks, most philosophers and many doctors have stressed the relationship between body and mind (Waddell, 2004).

So neither ought you to attempt to cure the body without the soul.... For part can never be well unless the whole is well (Plato, 424-347 BC).

Musculoskeletal health is rooted in anthropology and physical anthropology (anthropometrics) in that it is pre-disease or illness, whilst MSDs are underpinned by medical anthropology, as this evolved in the 1960's. Physical biomechanical and biological aspects of musculoskeletal function would be categorised in the same manner. The

broader psychosocial aspects are both multifactorial and multidimensional as no single perspective could cover the array of complexities that interplay between the conscious and subconscious untamed mind (Levi-Strauss, 1966). An epistemology of complexity combined with the rigour of *bricolage* (Kinchaloe & Berry, 2004; Kinchaloe, et al., 2013) allows freedom to explore the range of perspectives and influences. Integration of the physical and psychological self, and how we construct the world around us, is an integral part of this research:

If you are distressed by anything external, the pain is not due to the thing itself, but to your estimate of it: and this you have the power to revoke at any moment (Marcus Aurelius 121-180 AD).

This thesis cannot deny the potential for objectivism, founded by Ayn Rand in 1943 (Crotty, 1998) as an epistemology or ontology in that what does or does not occur within consciousness or is or is not outside of consciousness, intellectually, should not be ignored when we still understand so little about human beings. We do not know what we do not know and we live day to day in a world, which is, our reality whether others agree with that does not really matter as our experience is different to that of anyone else and what makes each individual happy or well is very personal. Objectivism could account for the “elephant in the room” where neither the individual nor the practitioner can understand causation e.g. childhood abuse could be said to fall into this category where the mind has suppressed the occurrence/s and may not be recalled by the person or considered by the practitioner.

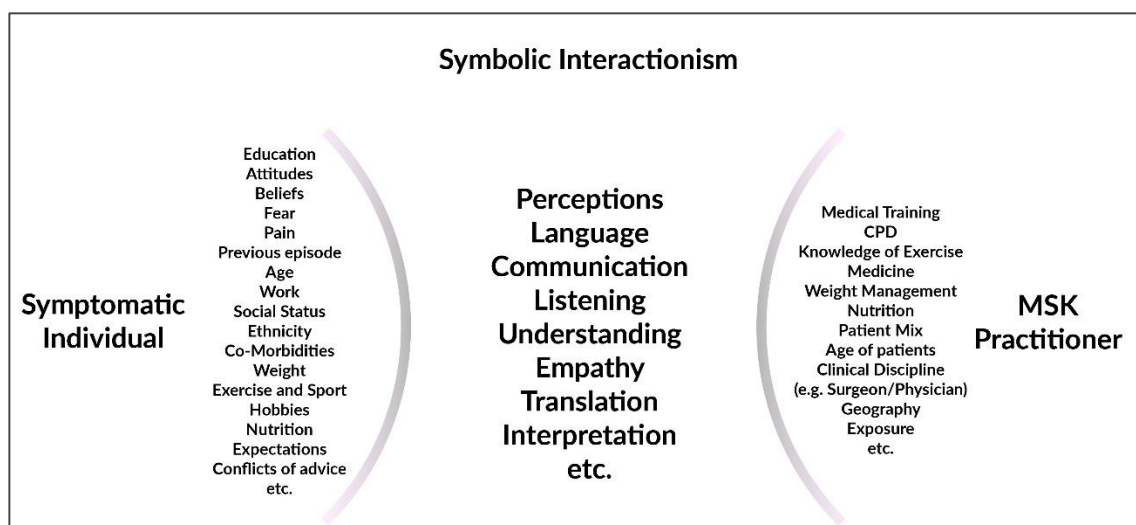
The findings from this research, suggest that the medical model, and the integrated evolutions, such as the biopsychosocial model, tend to lend themselves more to the tenets of constructionism, (Crotty, 1998). This evolved from Jean Piaget’s (1896-1980) constructivism and reflects how we understand our experiences, gain knowledge and the relationships with our ideas, what we discover and learn (Crotty, 1998). For many symptomatic individuals who are frustrated by their pain, then subjectivism may also be an appropriate doctrine, in that, it is *their* reality that matters and they doubt that others, including clinicians, really understand.

The Cartesian Doubt philosophy where Descartes (1664) questioned whether any belief is true would be difficult for individuals with musculoskeletal pain to accept. Attempts to challenge an individual’s belief is fraught with difficulty (Buchbinder, Jolley, & Wyatt, 2001) but is a path the practitioner must face with the patient if progress is to be achieved. The power of an individual’s belief that cannot be changed (subjectivism) is sometimes difficult to assess or comprehend (Halligan & Aylward, 2006).

Knowing yourself is the beginning of all wisdom (Aristotle, 384BC-322BC)

A patient's interpretation of their pain or their condition is almost as individualistic as their deoxyribonucleic acid (DNA). They construct an understanding from their exposure, experience and engagement with the world since birth and what they may have been led to believe by their parents, their friends and family, (Brooks, et al., 2013) and their religion or culture (interpretivism). They may have been exposed to an event, incident, social group or person that developed, influenced and or modified their belief and or may have affected their behaviour (symbolic interactionism). They may have heard language which they interpreted (Butow & Sharpe, 2013) in a different way to what it was meant (modern hermeneutics). These attitudes, beliefs, experiences and fears mean that there may be a possible "communication" or "interpretation" by the patient and that this is complicated by similar individual constructs of the practitioner (Figure 4).

Everything we hear is an opinion, not a fact. Everything we see is a perspective, not the truth (Marcus Aurelius 121-180 AD).



Gellatly, 2017

Figure 4: Interpretivism – the risk of miscommunication

Patients seek answers to their problem so that they may pursue happiness and wellbeing by being free of their pain or their dysfunction whichever is the more "bothersome" to them. Their self-interest may drive a behaviour which may be attitudinal "treatment is my right" or it may stem from a belief such as pain means harm and "I need to be fixed".

You have power over your mind - not outside events. Realize this, and you will find strength (Marcus Aurelius 121-180 AD).

Severity of pain and the potential for the development of moderate to severe anxiety and depression can develop from these psychosocial factors. Perceived injustice (a recognised psychosocial state) can arise from an apparent modest occurrence in the workplace, e.g. dissatisfaction with modifications to assist a return to work (Johansson, Lundberg, & Lundberg, 2006). Negative cognitions about a situation, for example an employer not meeting an expectation of the employee, can develop into not only long term chronic musculoskeletal pain and absence from work but can also depressive symptoms (Scott & Sullivan, 2012). Influence of significant others, including doctors (Anema, et al., 2002) partners and close friends, can also negatively affect attitudes and beliefs and influence return to work outcomes (Kidd, Bond & Bell, 2011; Brooks, et al., 2013).

Very little is needed to make a happy life; it is all within yourself, in your way of thinking (Marcus Aurelius 121-180 AD).

Identifying a patient's belief or beliefs about their pain and addressing these beliefs prior to engaging them in treatment is thought to engage the patient in the decision making process, help them understand what is required of them and hence should improve patient outcomes (Dima, et al., 2013).

Yet the development of the physical sciences appeared to have ignored human behaviour as suggested by Stahl (1660-1734) and orthodox medicine has continued to focus on the *body and pain* (Waddell, 2004).

A pain, an ache, a discomfort – these are the common complaints of those that seek the doctor's help. Pain issues a warning with kindly intent. She calls to action and, pointing the way, brooks no delay. And thus the ancient cycle is served, from pain to cause to treatment to cure (Penfield, 1969).

This practice continues to exist albeit that a growing number of researchers and clinicians have been suggesting for forty years that this needs to change. The continuing focus on a linear relationship between pain and some other construct remains one of the key issues.

Conversely, some biopsychosocial practitioners have almost transgressed to a focus totally on *mind and pain*.

Pain is a complex sensory and emotional experience. It is much more than just a signal of tissue damage (Arnand & Craig, 1996).

This somewhat misses the holistic nature of human beings and how we function.

3.4. The medical model framework

The assumptions of the medical model as outlined by Waddell (2006) are each critiqued as follows:

3.4.1. Critique of assumption 1

Recognised pattern of symptoms and signs identified a medical history and clinical assessment/examination

Identification of the scale and complexity of MSDs is fraught with many difficulties.

3.4.1.1. Self-reports

The clinician, often initially a GP or a physiotherapist, will be reliant on the individual self-report of symptoms and exposures to work demands and or sporting or social activities (Waddell, 2006). This description of symptoms and how they are perceived to have arisen is complex when an injury or disease is not apparent from a physical examination (O'Sullivan, et al., 2016). In addition, the knowledge of the practitioner may mean that causation or contributory risks outside of the standard GP or physiotherapy training is not considered.

3.4.1.2. Subjectivity

The most common musculoskeletal illnesses are mild to moderate problems, which as mentioned in chapter 2, are often normal consequences of activities of daily living and are not associated with the presence of any disease or injury (Carlson & Carlson, 2011) but the person's belief may be somewhat different (Engel, 1977). With chronic pain patients, the precise aetiology is often unclear with no obvious causation such as a fracture, tumour, infection or arthritis (Carlson & Carlson, 2011) but even the presence of a condition such as a degenerative change or disc bulge does not mean that such findings are either causative or contributory (Jam, 2014; Brinjikji, et al., 2015).

Many musculoskeletal conditions will resolve without any intervention and recovery timelines are published in clinical and general media formats. The dilemma facing the practitioner is the expectation of the patient. Approximately, 30-40% of individuals (Foster, Hartvisgsen & Croft, 2012) who visit their General Practitioner (GP) will expect to be referred to a specialist for diagnosis and treatment. MSDs account for around 30% of visits to a GP (CSP, 2017). Low back pain alone accounts for some seven million visits in one year in the UK, and regarded as a low clinical priority (Sanders, Foster & Ong, 2011). This may be interpreted by the patient as being uncaring and unsympathetic (Breen, et al., 2007) and

may drive referrals to private healthcare as suggested by the prevalence rates identified in this thesis (chapter 5).

The most common presentation involves *pain* (e.g. 99% in patients with back problems) that is subjective but it is a symptom, whilst disability is a restricted activity (Waddell, 2004) and potentially should be more of a concern. Pain is the phenomena that clinicians and philosophers have tried to understand for centuries and Descartes (1664) developed the Cartesian model of pain pathways in an attempt to illustrate the problem. Since then modern pioneers of pain continue to be vexed by this phenomena:

Reflection tells me that I am so far from being able to satisfactorily define pain, of which I write, that the attempt could serve no purpose (Lewis, 1942).

3.4.1.3. Reliability of assessment tools

And I place the interrogation of the patient first, since in this way you can learn how far his mind his healthy or otherwise; also his physical strengths and weaknesses and get some idea of the part affected (Rufus of Ephesus, 100 AD).

Reliance on a number of different predictive instruments is another challenge for clinicians and reference to a sample of the tools and associated issues are outlined below:

Assessment tools to link restriction in function with pain have had limited success and only show a moderate ability to predict function-related outcomes success (Hilfiker, Bachmann, Heitz, Lorenz, Joronen & Klipstein, 2007). Flaws in reliability affect accuracy of diagnosis, patient risk and deciding the most appropriate care pathway.

An assessment instrument tool for low back pain (LBP), STarT Back has been specifically designed to address MSDs and to reduce treatment seeking and direct interventions that aid the understanding of self-help. This specific prognostic tool is currently one of the most accepted and well used instruments for identifying psychosocial factors and modifiable risk factors in the management of back pain. It provides a scoring mechanism to place patients into low, medium and high-risk groups based on the likelihood of the patient achieving a successful outcome from the current care pathways and found to improve health benefits and reduced cost (Hill, et al., 2011).

Pain intensity measurement tools include the Visual Analogue Scale (VAS), Numerical Rating Scale (NRS) and Verbal Rating Scale (VRS) may be used to measure pain pre and post intervention (Haefeli & Elfering, 2006) are based on subjective reporting. Although they may have some value from an individual perspective they are not reliable for comparison

purposes and can easily be manipulated by an individual if they so wish (e.g. when trying to justify an absence).

Tools to support the diagnostic and outcome process, such as Short Form 6D (SF6D), the EuroQuol 5D (EQ5D), Oswestry Disability Index (ODI) and Roland Morris Questionnaire (Roland & Fairbank, 2000) have different uses, vary in their appropriateness and are reliant on practitioners using them for the most effective purpose (Johnsen Helium, et al., 2013).

Psychological assessment tools include: Modified Somatic Perception Questionnaire; Modified Zung Depression Index; Orebro Screening Questionnaire for Pain and the Pain Self-Efficacy Questionnaire (Main, Sullivan & Watson, 2008).

Arthritis Research, Keele University and the University of Oxford have developed an outcome measurement tool, (MSK-HQ) and this questionnaire aims to consolidate information that may have previously been ignored or assessed using multiple tools. The tool has undergone initial validation checks and validity assessed against other well-used tools including and had high completion rates, excellent test-retest reliability and validity (Hill, et al., 2016).

Whilst this questionnaire is a significant improvement over the use of multiple tools it is positioned as an outcome measure and fails to address the range of possible covariates outlined in this thesis. It focuses more on the immediate impact an MSD has on day-to-day activities rather than consider the longer-term risks.

A final factor associated with assessment process and the reliance on self-reports is that the individual may be lying, faking the illness or using deception to gain a benefit. Tools exist to evaluate the likely presence of such problems where suspected and these include the Minnesota Multiphasic Personality Inventory (Main, Sullivan, & Watson, 2008). A patient's clinician is also the patients' advocate and use of such tools are more likely to be considered by an independent assessor or claims adjudicator.

3.4.2. Critique of assumption 2

Inference of an underlying pathology and diagnosis

After exclusion of any serious pathology, MSDs are predominantly non-traumatic injuries with a broad differential diagnosis and often without a specific diagnosis despite thorough history taking and examination (Waddell, 2006). Whilst the medical model may work well for severe medical conditions (e.g. osteoarthritis of the hip) the medical model as

suggested above assumes a linear relationship between disease – symptoms – disability – and incapacity for work (Waddell, 2004, pp 38).

3.4.3. Critique of assumption 3

Application of therapy to that pathology via clinical pathway of treatment and rehabilitation

The clinical assessment or diagnostic triage process is complex for a number of reasons as outlined above. As a result, the link between a definite pathology and pain is small, for example, only 15% of back pain patients have an identifiable reason for their pain (Refschauge & Maher, 2006; Koes, van Tulder & Thomas, 2008). The clinician may be aiming to treat a pathology, which has not been identified, and that he/she cannot define to the patient. The result is that the therapy may deliver some improvement but may not achieve a successful short or long-term outcome. Recognition of this fact has led to the development of a number of different treatment models.

3.4.4. Critique of assumption 4

Expectations that the patient will recover completely or with an expected level of disability

Medicine is supported by an uneven evidence base (Lohmander & Roos, 2015) and is reliant on a plethora of research from high cost prospective randomised controlled trials (RCTs) to smaller retrospective studies. What may be evidenced based at one time may change dramatically over the years and the intervention be withdrawn having at worst caused harm. This is evident from the latest NICE guidelines (2016) and information from the Academy of Royal Medical Colleges (Malhotra, et al., 2015). The clinicians remain frustrated by the ongoing failure to achieve the desired outcome for the patient, whilst the patient remains frustrated that their pain or dysfunction continues.

3.4.4.1. Locus of control

Awareness of the limitations of the medical model may help patients understand that the presence of a clinical finding and pain, are not necessarily, associated and may assist with the acceptance that medical solutions are not often the answer. For clinicians that understand they face a number of barriers when endeavouring to advise the patient that recovery is within their control. Patient expectations or beliefs about their condition or treatment often prevent them from listening to or understanding the nature of pain and the connectivity with the brain (Moseley, 2017). Language used by a clinician (e.g. to

describe a diagnosis) may be translated negatively by a patient as outlined in chapter 2 and discussed below (page 67).

Clinicians may also feel that: they have insufficient time; lack appropriate training or believe that the individual will not engage in behavioural change (McPhail & Schippers, 2012) which may lead them to give a patient what they want rather than what they need.

3.4.5. Summary

Providing clinical treatments even though they may fail, as a way to appease the patient, in hope, or as a last resort, without discussion and effective engagement to address the possible range of issues, is likely to reinforce behaviour and create further dependency (Nicholas, 2008; McPhail & Schippers, 2012). Recognition of this problem has existed for some time and a standardisation of care across the varied professions to improve the provision of evidence-based practice for the benefit of the patient and to reduce cost to the NHS was recommended by the Arthritis and Musculoskeletal Alliance (2004) and led to the introduction of the Musculoskeletal Services Framework (2006). Yet the development of a more holistic solution to the multifactorial nature of MSDs is still to be found.

3.5. The medical model interventions

Interventional strategies have continued to increase over the years (Manchikanti, Singh, Pampatis, Smith & Hirsch, 2009) albeit that the driver for these interventions vary. A range of treatment options exist (Hoy et al, 2014b) the most common and conservative of which are outlined below.

3.5.1. Manual therapy (manipulation, mobilisation and massage)

Traditional approaches to MSDs has included the provision of manual therapy and the biomechanical model (BMM) to treat what has previously been thought to be the potential causative or contributory factors associated with many painful MSDs. This has included poor postural behaviour, sub-optimal motor control, hypo or hypermobility. The intervention, which utilised a therapy to “correct” dysfunction, was viewed as an effective form of treatment (Wellens, 2010).

The evidence of the success of this approach is somewhat limited possibly because there appears to be an expectation that if a therapist can “correct” a dysfunction or muscle imbalance that this can be sustained (Wellens, 2010). The emergence of the neurophysiological model (NPM) as an adjunct to the biomechanical model has led to

research which is suggesting that NPM could be more effective but for what reason is unknown (Wellens, 2010).

There are two issues with this development:

1. The correction of any dysfunction by a therapist should be an initial stage of a care pathway rather than an isolated short-term treatment;
2. A skilled practitioner should, develop a graded exercise programme, to support the individual to engage actively in his or her own treatment, if the correction is to be maintained long-term and if dependency is to be avoided (Nicholas, 2008).

The debate about the lack of evidence around the success of the biomechanical model (BMM) appears to be associated with the lack of evidence to achieve long-term change.

This may be due to two parallel constructs associated with symbolic interactionism:

1. The patient may believe that by consulting a therapist that the condition can be “fixed” and accept the need to undertake a few exercises to assist the process but not expect to undertake permanent modifications to their previous behaviours if success is to be sustained;
2. The practitioner may believe that the therapy will affect a cure or may not have the required level of competency to provide the individual with an ongoing range of exercises designed for continuous improvement of the individual’s skeletal muscle health. Alternatively, they may encounter a patient whose expectations are passive involvement in their recovery, rather than active, unaware that any short-term apparent positive results will subside as the individual returns to type.

An assumption in research associated with the BMM is that a dysfunction or clinical reason is the cause of pain. This seems to contradict what is known about pain and to attempt to link pain with a specific problem is often futile. It is the conceptualisation of illness, by an individual and the principle that pain, must mean illness, disease or injury (Nicholas, 2008) that led to the development of the biopsychosocial model (BPSM) by Engel (1977) which, describes pain phenomena, or the basis of it (Kendal, et al., 1997).

The provision of the most appropriate treatment following an acute onset of musculoskeletal pain would appear to be a simple process of assessing the patient and deciding what is best for that patient. Debates exist around what treatment should be provided and when (Koes & Tulder, 2005; Nicholas, 2008). Practitioners may align their practice with research, which they support without a full evaluation of all of the issues.

Literature would suggest that manual therapists and physical therapists use a postural-structural biomechanical (PSB) assessment process and provide exercise to correct any issues identified (Lederman, 2010). Provision of exercise by such therapists tends to be limited to very basic models as is apparent from university training courses and the supporting exercise software commonly used by physiotherapists (PhysioTools, Tampere, Finland). Manual therapy may be inherent within physiotherapy but this term also incorporates both the practices of osteopathy and chiropractic medicine. Osteopathy developed as a campaign against orthodox medicine and the “*indiscriminate use of drugs*” believing the body has within itself the power to combat disease (Still, 1899).

*“it is our natures that are the physicians of our diseases. We must not meddle nor hinder Natures attempt towards recovery. First do no harm”
(Hippocrates, 460-370 BC).*

The heart of osteopathy is the recognition of the body’s ability to heal itself, with some external help, of most pathologic conditions.

*The body is a unit. It does not function as a collection of separate parts but is an integrated unit. The person is a single entity of body and mind
(Martinke, 1991; Seffinger, 1997).*

Osteopathy is not recognised by the NHS or NICE as an “evidence based” treatment but it does promote healthy lifestyles, proper nutrition, and exercise (Chapman-Smith, 2000). Acceptance by private health insurance companies is limited normally to a relatively small annual out-patient benefit.

Chiropractic treatment, founded on a strong philosophical base with a strong emphasis on mind-body relationship (Waddell, 2004), has a lower acceptance by the medical profession.

3.5.2. Physiotherapy services

Physiotherapy services are integral to primary care delivery but within the NHS may be subject to unacceptable waiting times that encourage symptomatic individuals to access private treatment via a healthcare plan or direct funding by an employer. Treatment normally consists of an initial assessment, which may vary by practitioner in terms of content, e.g. gait (Toro, Nester & Farren, 2003) and up to five, face-to-face, sessions and may, be provided even when the condition will resolve without intervention, as identified in the data accessed during this research but not outlined due to commercial sensitivity. A physiotherapist may offer other treatments (e.g. acupuncture), which may or may not be acceptable to the patient and may be dependent on their beliefs (Hopton, Thomas & MacPherson, 2013). Encouragement for physiotherapists to embrace the psychological

presentations continued through the nineties and into the 21st century (Nicholas & George, 2011; Nicholas, Linton, Watson & Main, 2011) and continue to this day (O’Sullivan, et al., 2016; NICE, 2016) but whether physiotherapists feel comfortable with this approach is open to debate (Sanders, Foster, Bishop & Nio Ong, 2013) as discussed in chapter 8.

Changing clinicians’ behaviour remains a major challenge (Sanders, Foster & Ong, 2011) but in 2012 Foster, Hartvigsen and Croft proposed discussion on responsibility, for initial assessment of patients with MSDs. Following an audit of GP practice by the Chartered Society of Physiotherapists (CSP, 2016b) it was suggested that 20-30% of GP time could be reduced by access directly to a physiotherapy service. If this assumption could be converted into practice it would be of significant interest to GPs facing ever increasing pressures on time and complexity and it is thought that 41% of commissioning groups are now piloting this service (CSP, 2016b).

3.5.2.1. Physiotherapy and outcomes

The patient reported outcome (PROM) may or not be recorded and other objective measurements may not be taken. The success or otherwise of physiotherapy as an intervention is inconclusive across all areas of utilisation. A study by Childs, et al., (2005) suggested that those physical therapists that had an orthopaedic clinical speciality or sports clinical speciality scored higher than other clinicians with the exception of orthopaedic physicians. The introduction of the new MSK-HQ tool, developed by Keele University and the University of Oxford, may provide some valuable insights (Hill, et al., 2016).

3.5.2.2. Physiotherapy and psychosocial factors

Many physiotherapists will recognise negative attitudes, beliefs and fears towards their pain but few will recognise the occupational and financial obstacles to recovery and only a small number of practitioners will know how to address them (Sanders, et al., 2013) as found in this research and as documented in chapters 6, 7 & 8.

3.5.2.3. Physiotherapy and exercise

Whilst a physiotherapist is competent to “prescribe” exercises as part of their treatment, they do not have the same competencies as an exercise professional. This was recognised and led to the creation of the consultant post in Sports and Exercise Medicine (Faculty of Sport and Exercise Medicine, 2009) within the NHS at the time when activity levels were predicted to increase and a greater number of injuries from: functional weaknesses; poor graduation; inappropriate training or equipment were expected.

Specific training for physiotherapists in exercise to support amateur athletes including: runners; cyclists; swimmers and triathletes, is likely to be beneficial as exercise has been accepted as a treatment for low back pain for many years (Rainville, et al., 2004; O'Sullivan, 2011; O'Sullivan, et al., 2016) in individuals irrespective of causation (e.g. sport or work). Improving competency of physiotherapists or using a multidisciplinary approach may reduce the uncertainties around exercise-based interventions by researchers (Shiple & Nubile, 2003).

3.5.2.4. Physiotherapy and other risk factors

A physiotherapist will also have limited training or experience of treating other contributory factors including: excess weight, inactivity, poor strength and conditioning, poor nutrition and specific occupational requirements (as found during this research and documented in chapters 6, 7 and 8) unless trained in each of these areas. Patient expectation is they can assist with all of these multiple issues placing pressure on the physiotherapist to deliver. If the problem is not resolved in a few sessions then the patient's expectation will be for an onward referral resulting in additional, often unnecessary, cost to the NHS and or the employer or insurance company.

3.5.3. Interventional pain medicine (IPM)

The development of interventions such as injection therapies has further maintained the individual requirement for a "quick fix" (Geisser, et al., 2006). Between 1997 and 2006 there was a 200% increase in interventional procedures in the USA (Manchikanti, et al., 2009) and discussion with the NHS suggests that UK has also experienced substantial increases, especially in the performance of facet joint injections. Physiotherapists who specialise in injections report positive outcomes (Smith, Meadows, Myers, Reynolds & Woodhead, 2014) but whether these are sustained is unknown.

IPM appears to have emerged as the criticisms of the BMM have increased. Yet the problems associated with this model are around the use of the BMM as its orientation and the failure to address the more complex nature of the individual and their pain. NICE (2016) has now removed such injections as an acceptable evidence based therapy for the treatment of low back pain. The provision of such therapies can, with certain patients, also encourage a treatment seeking mentality which continually needs feeding and which does not help them address their pain (Main, Sullivan, & Watson, 2008; Roth, Geisser & Williams, 2012).

3.5.4. Pharmacological therapies

Medications offered include non-steroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, nonnarcotic analgesics and narcotics (Conaghan & Brooks, 2008; Carlson & Carlson, 2011) but subconscious or conscious dependency may occur and may be associated with the attitudes, beliefs and fears of the individual. Medication such as paracetamol, commonly used to treatment LBP was found to be ineffective (Machado & Maher, 2015). Suggesting that therapies that may increase dependency and the risk of toxic load need to be carefully considered (O’Sullivan & O’Sullivan, 2015) but if used with exercise as a self-help strategy can be beneficial (Hawkes, 2007).

3.5.5. Surgery

Surgery should be a last resort after conservative treatments have failed (Conaghan & Brooks, 2008) unless a “Red Flag” has been identified (Carlson & Carlson, 2011). Randomized control trials, which review surgical interventions, (Conaghan & Brooks, 2008) and revisions to guidance can take many years as recently evidenced by the NICE guidance on spinal fusions (Mannion, et al., 2016). In the interim, patients often believe surgery will resolve their problem and are frustrated when any short-term relief is not maintained.

3.5.6. Integrated solutions

Engel (1977, 1980) identified the need to consider the psychological aspects of pain concurrent with the mechanical issues. His work led to the development of a number of models that consider the physical, psychological and social related aspects of pain management and the need to challenge the biomedical model (Engel, 1989).

3.5.7. Process approach

The process approach (Lederman, 2015) is an alternative to the traditional manual therapy or structural model (compared in Table 6, page 67) that he adapted from the modifiable and non-modifiable determinants of health (e.g. age, gender, family, lifestyle, work, and environment) outlined by the Rainbow Model (Dahlgren & Whitehead, 1991) and termed this as multidimensional management (Lederman, 2013). It focuses on self-help, utilising the skills of the therapist, to guide the symptomatic individual in a manner that provides education to support the self-recovery process and that the loci of recovery and health are innate processes with the body/person (Lederman, 2013) influenced by a range of other biomechanical, biological, psychological, social and occupational factors.

This approach changes the traditional therapist/patient role relationship. Changing clinical practice remains a major challenge (Wellens, 2010; Sanders, et al., 2011) and practitioners need to take responsibility (Foster, et al., 2012) to influence the management of the range of factors outside the locus of control of the individual rather than ignore their presence. The utilisation of this approach was not found during this research or known to the participating practitioners.

Table 6: General principles of the traditional structural model versus the process approach

Structural Model	Process Approach
Self-healing / recovery premise	Self-healing / recovery premise
Management focuses on creating ideal biomechanical conditions for recovery	Management focuses directly on recovery processes
Manual techniques or physical activities aim to correct structure or biomechanics	Manual techniques or physical activities support recovery processes
Medical diagnosis + biomechanical and anatomical considerations	Medical diagnosis + by which process will the individual improve Identifying underlying recovery processes.
Tissue causing symptoms	Tissue identification not essential for management
Therapist or clinically determined management goals	Patient determined management goals
Structural change as therapeutic target	Patient determined functionality as therapeutic target
Management in the biomechanical dimension	Multidimensional management
Therapist dependent / external locus of health	Emphasis on self-care / independence / autonomy internal locus of health
Pathologising normality (postural deviations, asymmetries, imbalances, weak muscles, etc.)	Focus on pathways/opportunities to recovery. Positive messages and empowerment
Recovery occurs during the clinical sessions	Recovery occurs in individual's environment
Exercise dissimilar to human movement (extra-functional)	Functional management created from the patient's own movement repertoire
Education - anatomy / biomechanics dominated	Education - processes directed

3.6. The biopsychosocial model (BPSM)

The debate around the evidence for a model which considers posture, postural habits (Brumagne, Janssens, Janssens & Goddyn, 2008; Brumagne, Janssens, Knapen, Claeys & Suuden-Johanson, 2008) and dysfunction, or a neurophysiological model which may explain

the effects manual therapy has on pain, (Wellens, 2010) has been debated for more than twenty-five years. Both models appear to focus on “pain” but pain is a subjective phenomenon which is both difficult to define and often difficult to establish an exact causation. A review of imaging features of spinal degeneration (n = 3110), conducted by Brinjikji, et al., (2015) found evidence spanning seven decades, of degeneration ranging from 37% to 96% (between the ages of twenty and eighty) that were pain free. Disc bulges range from 29% to 43% and annular fissure from 19% to 29%. Further studies by Guermazi, et al., (2012) also found similar “abnormal findings” on knee MRI’s for patients with and without pain. These findings suggest that the presence of pain cannot be directly linked to the actual condition (e.g. degenerative disc disease, disc bulge or disc herniation) as often inferred by the medical model and that other reasons for pain must exist. The more sophisticated the diagnostic process and the older the patient, the more likely false negatives and false positives occur (Waddell, 2004).

Treating pain is important for the patient and advocates of the psychosocial approach suggest that this intervention is successful (van de Windt, Hay, Jellema, & Main, 2007; Rogers, Gardner, MacLean, Brown & Darling, 2014). Yet a focus on psychosocial issues may ignore relevant biomechanical issues that may deteriorate and cause problems in time (O’Sullivan, et al., 2016).

BMM infers that we break and wear out and the tolerance is far lower than that of a biological model, which can adapt and repair itself, a concept more aligned to the self-help model (Lederman, 2010) and some of the older more holistic models. The BPSM model developed as an integrated approach (Hunter, Sharp, Denning & Terblanche, 2006) appears in practice to dismiss many of the biomechanical and biological issues without questioning whether there have been flaws in how patients been assessed and treated.

3.6.1. Psychosocial flags

BPSM gained growing acceptance throughout the nineties and became more popular at the turn of the century (Sullivan & Stanish, 2003; Burton, Kendall, Pearce, Birrell & Bainbridge, 2008) following the publication and development of the *Flag System* (Nicholas, Linton, Watson, & Main, 2011) outlined in Table 7 (page 69).

Table 7: Definition of psychosocial flag classification

Flags	Definition/Attributes
Red	Serious pathology e.g. trauma, fever, unexpected weight loss, saddle anaesthesia, a history of cancer and neurological deficits.
Yellow	Attitudes, beliefs, fears, behaviours, emotions, perceived injustice, enjoyment of the sick role.
Orange	The presence of serious mental health illness: Stress/anxiety/depression; personality disorders; major psychiatric illness; significant psychological illness; OCD; PTSD; drug abuse; significant learning disorder.
Blue	Associated attitudes and beliefs about work or the provision of policies and benefits at work which may reinforce a behaviour.
Black	A financial benefit of some form such as; sick pay entitlement; an Employer's Liability claim; Group Income Protection claim; Incapacity benefit.

This provided musculoskeletal practitioners with a framework for understanding the biological, psychological and social aspects of musculoskeletal pain and their presentation (Table 8). Whether practitioners really understand how to recognise these possible “flags” and more importantly whether they actual are able to treat these issues has been identified in literature (Bishop & Foster, 2005; Sanders, et al.,2013).

Table 8: Examples of possible psychosocial presentations

Issues	Presentations
Attitudinal	Sayings: I am entitled to treatment; “it is my age”; “I need to be fixed”. Positive or negative attitude to the pain and potential treatment.
Belief	Clinicians are always right; my neighbour/friend had this treatment and it worked; cannot return whilst in pain; pain will increase with activity; unable to forsee a return to work; catastrophic thinking fearing the worst; misinterpreting bodily symptoms; pain is uncontrollable and passive attitude towards rehabilitation.
Fear (avoidant)	Pain means harm and it will hurt more if I move.
Behaviours	Use of extended rest/downtime; reduced activity & withdrawal from activities of daily living; Irregular use of/poor compliance with exercise & tendency to ‘boom+bust’; avoidance of normal and productive activity; Reports of high pain intensity 10/10 or 11/10; excess reliance on aids & appliances; poor sleep quality; increased use of drugs, alcohol & smoking.
Conflict	Diagnostic/treatment difference of opinions; use of medical terminology which is negatively interpreted; health professionals sanctioning disability & not gearing interventions to improve function; dramatisation of pain by health professionals causing dependency on treatment; continued receipt of passive therapies; expectation of quick/easy cure; lack of satisfaction with previous therapy; advice to change/withdraw from job.
Emotions	“I feel ill and I need help!; fear of increased pain with increased activity; depression; increased irritability; anxiety about and increased awareness of bodily sensations; difficulty maintaining sense of control; social anxiety/disinterest in social activity; feeling useless and not needed.

Table 8 continued: Examples of possible psychosocial presentations

Issues	Presentations
Family	Too much or too little support/attention; over-protective partner; solicitous behaviour from partner; socially punitive responses from partner; extent to which family support return to work; lack of person to talk to about a problem.
Perceived injustice	"My employer/the government are responsible".
Enjoy sick role	A person likes the attention and the "rest" from work/life.
Work (Blue Flags)	Low educational/socioeconomic status. History of manual work and/or significant biomechanical demands (e.g. heavy/frequent lifting, extended periods in static postures, whole body vibration, constrained postures). Repetitive/boring work and/or job dissatisfaction. Frequent job changes. Stress and/or poor relationships (unsupportive/unhappy work environment). Minimal availability of modified duties/return to work policies. Negative belief employer is responsible for recovery. Lack of early access to OH services or OH which reinforces sick role.
Financial compensation (Black Flags)	Lack of financial incentive to RTW; financial incentive to stay off work e.g. sick pay/GIP/incapacity etc.; disputes about benefits – possible advice not to seek treatment as may affect pay out; History of claims due to other injuries – E.L./EAT/equality; previous successful receipt of benefit; ongoing medico-legal claim.

Adapted from (Kendall, Linton & Main, 1997; Nicholas, Linton, Watson & Main, 2011)

3.7. Multidisciplinary functional rehabilitation programmes (FRP)

Rehabilitation should be an integral part of clinical practice (Frank & Chamberlain, 2006) and the FRP is a form of rehabilitation designed to address the physical presentation of any dysfunction, provide basic exercise as a treatment and challenges psychological barriers to pain (Kamper, et al., 2015). These programmes should provide education beyond that provided by a GP or physiotherapist to manage current and future episodes of pain and where appropriate, offered as an alternative to surgery (Guzman, et al., 2001; Fairbank, et al., 2005). The original 100-hour model has been adapted by various practitioners to reduce time and cost (Hunter, Sharp, Denning & Terblanche, 2006; Lamb, et al., 2010; Rogers, et al., 2014).

It was envisaged that private insurance companies, for employees who have membership of a healthcare plan, would fund the programmes but few have supported the FRP resulting in a number of changes from the original model across the various providers. Knowledge of the variances is important if comparisons are to be made. Evidence exists that such multidisciplinary programmes are effective at helping people return to work (Waddell, et al., 2009; Rogers, et al., 2014) beyond low back pain to include upper limbs (Schakenraad, Vendrig, Sluiter, Veenstra, & Frings-Dresen, 2004; Meijer, Sluiter, Heyma, Sadiraj, & Frings-Dresen, 2006) and more effective than a non-interdisciplinary programme (Chou, & Huffman, 2007). Whether the effects are sustained over time appear uncertain and some

researchers have suggested that the FRP model does not provide any significant difference over “usual care” outside of the USA (Australasian Faculty of Musculoskeletal Medicine, 2005). An inherent problem in the FRP is similar to that of the medical model, in the provision of a programme that is standard for a group of patients, or an individual and not adapted to the needs of each person (Haland Haldorssen, et al., 2002). An important aspect of an FRP, which is not standard in all programmes, should be that the occupational focus is around fitness to perform the tasks within a persons actual work as a part of their work conditioning to return to their former duties (Schonstein, Kenny, Keating & Kopes, 2003) or understand the need for any limitations to that work.

Multidisciplinary programmes appear costly, when compared to out-patient treatments but cost effective when compared to surgery. A view from a CCG, gathered during this research, suggest that these programmes are valued by GPs, as they avoid unnecessary injections, reduce surgical interventions and effectively manage the “revolving door” patient. The latest NICE guidelines, which encourage psychological interventions and group exercise, may drive a resurgence of the FRP which considers a multidimensional approach, where no one specific treatment should be considered or operated in isolation (Vibe Fersum, O’Sullivan, Skouen, Smith & Kvale, 2012; Hofman, Peter, Geidl Hentschke & Pfeifer, 2013).

3.7.1. Chronic pain management (CPM)

In considering CPM the issue of definition once again arises with pain chronicity measured in different ways using different assessment tools, in different countries and the associated risks of reliability and comparability of outcomes. Traditionally CPM would have focused more towards a passive approach with the use of injections. In more recent years the application of the BPSM has introduced a more active element in which the patient needs to engage in their own recovery (internal locus of control) to improve the opportunities of a successful outcome. In this regard the psychosocial components are based around a cognitive behavioural therapy model which merges rational emotive behaviour therapy (Ellis, 1955) and cognitive therapy (Beck, 1967; Beck, Epstein, & Harrison, 1983) and includes stages of readiness to change: pre-contemplative; contemplative; action and maintenance. For a benefit to be sustained, maintenance is a critical factor and intrinsic motivation (Zenker, et al., 2006) is more predictive of long-term exercise adherence, compared to regulated short-term adoption (Teixeira, Carnaca, Markland, Silva & Ryan, 2012). This suggests that the success of an FRP and CPM needs to be monitored following completion of a programme, initially after a few months to monitor compliance but also

over several years, to understand ongoing outcomes and cost effectiveness (Gatchel & Okifuji, 2006). This would then establish whether “refresher” programmes would be beneficial as part of the ongoing support provided and to help individual manage any acute episode or difficult time. Very few studies document adherence to the exercise interventions (Butow & Sharpe, 2013) suggesting that this is a fundamental missing gap in the literature and could be a reason why certain interventions fail and especially those associated with the BMM.

Individual responsibility is a vitally important aspect of managing musculoskeletal health and ill health (Conaghan & Brooks, 2008). The UK Government has attempted to change individual behaviour with an array of self-management programmes including the formulation and implementation of the Musculoskeletal Service Framework (DOH, 2006), now archived. Yet the incidence of MSDs has continued to rise since this time and a further iteration launched in 2017. Arthritis Research (2017) published data forecasting an increasing prevalence in musculoskeletal related disorders due to: the ageing population; the increase in people who are overweight and obese and the associated risk factors with excess weight and inactivity, suggesting that the underlying issues are understood but still not apparent in practice.

Whilst older adults may believe in self-responsibility (Larsson & Nordholm, 2008; Jinks, et al., 2010) younger generations, may have a different expectation. Externalisation of responsibility appears greatest in those that are physical inactive, have musculoskeletal related absence and no education beyond the compulsory level (Larsson & Nordholm, 2008). The current responsibility to educate individuals lies primarily with society including authorities and clinicians, as it is believed that they have the knowledge of what to prevent and how to prevent it (Larsson, Nordholm & Ohrn, 2009) but evidence of the success of this not apparent.

The prevalence of psychosocial factors has led to the success, where used, of this approach in CPM on a one to one basis (Rogers, et al., 2014). Yet as discussed above the development of the group based FRP has not evolved. Conversely, CPM is often delivered on a one to one basis with the involvement of an orthopaedic physician and or surgeon to manage to co-morbidities and medication.

3.8. Conclusion

Research now suggests that successful management of MSDs needs to involve the patient in self-management and include a multidisciplinary approach of co-ordinated care,

(Conaghan & Brooks, 2008). The process approach, biopsychosocial model and chronic pain management programmes, all have elements of the issues that need to be addressed but potentially fail to understand and manage the importance of the non-clinical issues (e.g. weight management, activity, exercise, strength & conditioning). It would appear that a framework which considers the integration of the management of the *whole person* which incorporates musculoskeletal and sports medicine (Wilk & Abraham, 2007) and other appropriate skills to address the underlying and contributory risk factors, has yet to be developed in a manner which can be provided in primary care and integrate with secondary and tertiary care.

Development of a multidimensional model, as suggested in chapter 10, utilising flexible interventions, (Sullivan, 2011) adapted to meet the needs of each patient, as opposed to a standard care pathway for a condition, which straddles the clinical and non-clinical issues may assist in the return to a more holistic approach and improve outcomes for patients.

Chapter 4

Methodology and Methods

4. Introduction

The research involved four studies, with each stage informing the next. The first retrospective quantitative study accessed data initially between January 2011 and July 2014 but was then refreshed throughout the research process to extend the through to July 2017. As the data emerged from the initial study, and the need to further enquire why prevalence and incidence of MSDs is so high in workplace health emerged, it was evident that the research design needed to encompass an explanatory sequential mixed methods concept (Creswell & Plano Clark, 2011) including both quantitative and qualitative data (figure 5). This allowed the quantitative data, which had been captured naturally over a period of time, and varied with each organisation, to be combined with an open-ended approach to the collection of qualitative data (Creswell & Plano Clark, 2011). The combined analysis of the data provided an opportunity to better understand not only the extent of the prevalence and incidence of MSDs but why this may be occurring.

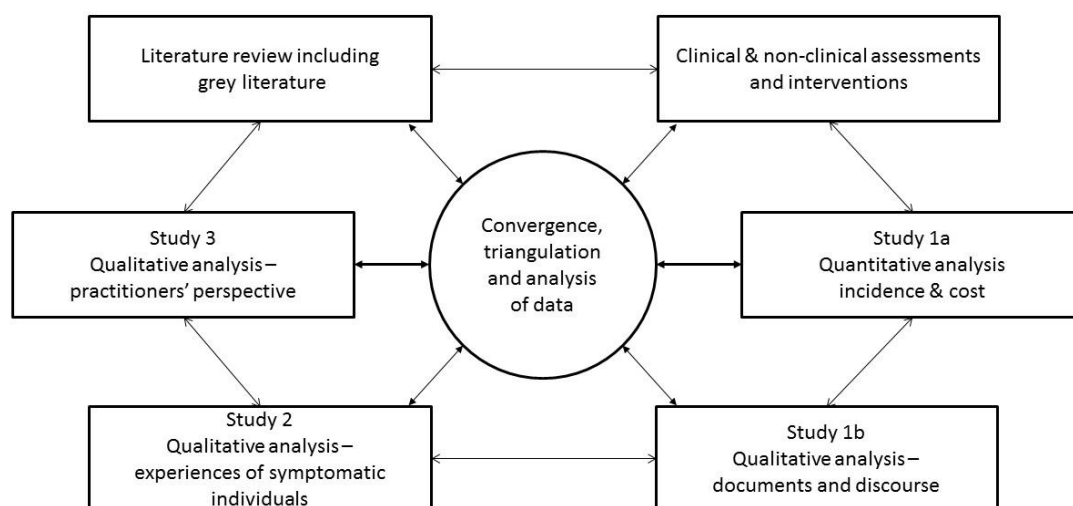


Figure 5: Explanatory sequential mixed methods research design – allowing each study to inform each other

4.1. Methodological considerations

The epistemology chosen was that of *complexity* (Kinchaloe & Berry, 2013) as this could embrace the multiple physical, psychological and social influences that could potentially affect the onset and maintenance of an MSD. Within the data viewed it was evident that

people construct their perception of their world from the exposures and experiences they individually encounter since birth and these are representative of a constructionist approach (Crotty, 1998; Creswell & Plano Clark, 2011). Yet variants of objectivism (Crotty 1998) and subjectivism (Crotty, 1998) could not be ignored. The *complexity* underpinning the range of possible causative and contributory risk factors MSDs required the freedom to move away from a single specificity (Kinchaloe, et al., 2013) or paradigm (Creswell & Plano Clark, 2011).

Whilst the quantitative data highlighted the prevalence across the participating organisations and it was important that the qualitative aspects provided an insight into why this may be the case.

An individual in today's society is surrounded by influences from the mass media, internet, social media and the way in which people interact with each other. These interactions can consciously or subconsciously shape attitudes, beliefs and fears. A relationship with "significant others" whether family, colleagues, managers, friends or practitioners (*symbolic interactionism*) can intentionally (or unintentionally) by the use of language (*modern hermeneutics*), action or inaction influence perception and associated behaviours. This is consistent with issues of *interpretivism* (Crotty, 1998) and the BPSM (Kendall, et al., 1997; Nicholas, et al., 2011).

From a methodological perspective, *ethnography* (Fetterman, 2010) allowed *anthropometrics* to underpin the physical or biomechanical aspects of musculoskeletal health whilst *medical anthropology*, guided the medical model (Crotty, 1998). Ethnography also links with the social aspects of the BPSM whilst *phenomenological psychology* (Langdrige, 2007) interfaces with the psychological component that also affects how a person, thinks, feels or behaves.

Discourse, provided the opportunity to gather data via informal conversations (Gilbert, 2013) and became an important component in understanding the implications of language allowing qualification of the views of practitioners, and examined using a thematic and psychosocial analysis (Braun & Clarke, 2006). Following the initial findings, an *action research* approach (Gilbert, 2013), was introduced to develop a methodology for a new way of working for Company D, (the findings after one year are summarised in chapter 5 and 9). The methods evolved as the research progressed: firstly, the quantitative data combined a data reduction and statistical analysis approach (Gordis, 2009) then the qualitative aspect commenced with the concept of extracting the data from: documents;

high level case studies; focus groups; interviews; meetings, telephone and face-to-face non-formal conversations and interpretative methods (Denzin & Lincoln, 2013).

4.1.1. A move towards bricolage

The inquiry that could embrace the explanatory sequential mixed methods study outlined and its constituent parts, transpired to be *bricolage*, which is said to encompass notions of *eclecticism, emergent design, flexibility and plurality* (Rogers, 2012) or in other words the multifactorial and multidimensional aspects of this thesis.

Bricolage allows the data to be viewed from several different perspectives, (Kinchaloe & Berry, 2013) which supports the complex nature of MSDs and how interaction, communication (Crotty, 1998) and distinct exposures to life and the world (Creswell & Plano Clark, 2011) can drive physical, psychological and social behaviours (Burton & Waddell, 2004). The two standpoints arguably taken in this research are the positioning of an *interpretative bricoleur* (Rogers, 2012) which reflects the very individualistic nature of the data and what can be construed from it and a *methodological bricoleur* (Rogers, 2012) which allows a very fluid and creative approach to the data and its meaning by adaptation of the BPSM.

4.2. A summary of each study

The following information provides the background to how each study evolved and informed the next stage of the research.

4.2.1. Phase 1 – Study 1a

The initial research considered the data held by the integrated health management provider (IHMP) in relation to the management of multiple employee benefits on behalf of major employers. The benefits ranged across traditional occupational health and safety, provision of benefits (e.g. private healthcare) and wellbeing.

This data had been captured over many years and due to the integrated nature of the services provided was thought to hold information on prevalence, incidence and cost. It was decided that an initial retrospective study would inform the need for any further prospective studies (Gordis, 2009; Sedgwick, 2014) and whether these should be quantitative, qualitative or both.

The limitations to a retrospective study can often be selection bias but this was overcome in that all cases that occurred between a period (as outlined in chapter 4) were captured. Recall bias was not applicable in the data sets and hence the data did provide evidence of

the population at risk. A disadvantage of this data is that it would not demonstrate causation but would allow access to data that may highlight possible confounding risk factors. This information would provide the foundations for commenting on the limitations of the data recorded and its historic nature as outlined in chapter 5.

It was evident from Study 1a, that quantitative data alone would not satisfy the intent of the research questions or address issues identified in chapter 2 and 3. Extending the research to an explanatory sequential mixed method study (Creswell & Plano Clark, 2011), to consider qualitative data associated with Study 1, using document analysis (Bowen, 2009) and the metaphor of critical bricolage (Kinchaloe & Berry, 2013) then led to two further qualitative studies combining different approaches as outlined.

4.2.2. Phase 2 – Study 1b

Answering questions raised relating to possible causation and underlying risk factors was the main purpose of the second study, which aimed to elicit an understanding of why prevalence and incidence was so high and what variations and themes may exist that may aid appreciation of complexity, pain and disability (Ong & Richardson, 2006).

The data accessed in this study considered pertinent case documents associated with study 1a, and spanned the period of the data collected January 2011 to October 2017. These representations, obtained from the computerised case files, included: clinical notes from an individual's GP and/or specialist; data recorded by the case manager; audio recordings of telephone assessments between a symptomatic individual and a physiotherapist (where these had taken place); information relating to job type and hours and, where available, and information relating to personal risks.

The audio files provided a good understanding of the patient and practitioner interaction and the clinical notes provided a diagnosis (where possible), treatment plan, treatment provided and sometimes outcomes, what was missing was any information relating to the individuals' experience. This data gap informed the need to conduct a further qualitative study.

4.2.3. Phase 2 – Study 2

This prospective qualitative study emerged from the data identified in Study 1b as an attempt to explore the experiences of symptomatic individuals. The initial intent was to gain this information via one or more focus groups within each organisation. However,

only one organisation (Company D) granted permission to allow a focus group of nine engineers who were on long-term absence with an MSD.

Three of the four organisations declined on the basis of:

- Concern about how these would be viewed by the symptomatic individuals;
- Difficulties associated with the potential confidential nature of the reason for their absence or ill health and asking them to attend a focus group;
- Concern whether expectations may be raised which the organisation could not fulfil (e.g. provision of private healthcare for all employees).

To address this set back it was decided that one to one interviews with symptomatic individuals over the telephone or face-to-face if they preferred would enrich the data.

The findings from Study 1a and 1b were triangulated (Silverman, 2011) with study 2, and it was felt that an analysis of the individual case studies would demonstrate the array of factors that can affect a symptomatic individual but did not reflect sufficient information relating to practitioners and other potential influencers. This led to a prospective qualitative study with a number of practitioners and other individuals involved in the assessment and management of MSDs. Other influencers identified were management within an organisation but due to the limitations of this thesis it was decided that the data in study 1b and 2 would be sufficient for this purpose.

4.2.4. Phase 3 – Study 3

The aim of this study was to use ethnographical inquiry (Fetterman, 2010) and symbolic interactionism (Crotty, 1998) with practitioners and other individuals involved in the management of MSDs to understand the perspective of clinical and non-clinical individuals involved in the assessment and treatment of symptomatic individuals. The non-practitioner data was accessed from: case managers; a manager from a university involved in training physiotherapists; musculoskeletal training organisations; NHS commissioners and NHS and private providers of care.

4.2.5. Summary of the evolution of the qualitative studies

It was important that this research design and the emerging data did not reflect a single perspective but allowed the data to highlight the multiple nature that underpin MSDs. It became evident as the data emerged that the methods for collating the qualitative data should combine both direct and indirect approaches. The indirect approach comprised a document analysis (study 1b) whilst the direct approach commenced with the concept of at

least one focus group followed by interviews with symptomatic individuals (study 2) and then practitioners (study 3).

4.3. Method – Study 1a

To access the data for this study initially required consent from each of the participating organisations (appendix 2). Recruitment of each company was undertaken by telephone and email. Five organisations were approached, one of which declined. The reasons why these organisations were selected was due to the range of information that was available including variations in job types (shift based, strenuous, active and sedentary roles) and access to data relating to the provision of benefits for the management of MSDs.:

The industries who participated were:

- Leisure – Pilots, cabin crew, engineers, retail, office and staff in resort locations;
- Manufacturing – Production and warehouse operatives, office based staff and sales;
- Hospitality – Corporate office based staff and a range of hotel employees;
- Utilities – Customer service based roles (mostly telephone based) and engineers (involved in driving and manual handling).

4.3.1. Research questions

- What was the prevalence of excess weight/obesity and lack of regular activity or exercise in symptomatic individuals with MSDs?
- What was the extent of psychosocial factors?
- What variations were evident between sedentary and non-sedentary occupations, age and gender?

4.3.2. Ethics approval

Ethics approval was gained for the retrospective study application 757/13/PG/CS (appendix 3) from data held on four separate organisations who provided consent to participate (appendix 2).

4.3.2.1. Ethical considerations

The data were anonymous, and from an symptomatic individual perspective it would not be possible to identify any individuals and the data remained totally compliant with the Data Protection Act and the guidance by the Information Commissioners Office. The

commercial data, which identified trends within the participating organisations, are commercially sensitive. Information relating to their providers is also confidential and as such identification of the organisations has been protected so far as is reasonably practicable.

4.3.3. Data sources

The retrospective data were summarised in descriptive format, from the computerised case files held on the Microsoft Client Relationship Management (CRM) database of an integrated health management provider (IHMP), who acts as data controller and data processor, of data in respect of the provision of various benefits for employing organisations (appendix 2). Consent to use the data for research purposes was obtained from the provider, the four participating organisations and from individual employees and/or their dependents. A summary of the data accessed is outlined in Box 2:

Box 2: Quantitative data volume and sources

Records included
<ul style="list-style-type: none"> • 4823 sickness absence records from two organisations including work-related absence within Company D; • 3243 management referrals from the four participating companies and included group income protection claims from Company C; • 12,031 healthcare plan claimants from all four organisations; • Physiotherapy treatments outside of healthcare plan members for Company D; • Wellbeing information for Companies A, B and D.

The original research questions were associated with the identification of the incidence of MSD's across various healthcare benefits in four organisations (see below). Covariates of excess weight (BMI > 25 kg/m²) and lack of exercise (< 150 minutes of moderate exercise or 75 minutes of strenuous exercise per week) age, gender, occupation and psychosocial elements were considered as possible confounding variables.

4.3.4. Research design

A retrospective quantitative study of data collected from four organisations from 2011 to 2017 relating to the benefits provided to employees and their dependents over this period and that were relevant to identifying the prevalence incidence and cost of MSDs.

4.3.5. Data flaws

Limitations with the data are summarised as follows:

4.3.5.1. Covariate data

Data capture on the covariates were found to be limited due to the following:

1. The case managers *initially* felt uncomfortable asking lifestyle related questions;
2. Physiotherapists recorded psychosocial factors in text fields which identified variances in understanding but could not be quantified;
3. Symptomatic individuals may not wish to disclose their weight, or may report a lower than actual weight;
4. Self-reported activity recordings were complicated due to an individual's perception of activity and or exercise (frequency, duration, intensity) and the case managers' interpretation.

4.3.5.2. Definitions and dates

The data from each organisation varied in the manner in which certain aspects were defined e.g. the coding used for the reason for absence; or the number of hours lost versus the recording of an absent day, these disparities are highlighted (page 80). None of the organisations had previously attempted to consolidate the data held about the health and ill health of their employees. The data were also collected for different periods due to contractual variances and availability of the data as shown in each table in chapter 5.

4.3.6. Musculoskeletal classification of disease

The organisations each had varying methods of recording MSDs. To consolidate the data into a comparable format the International Classification of Diseases (ICD) headlines were consolidated into the following (Box 3):

Box 3: Classification of disease

Musculoskeletal categories
<ol style="list-style-type: none">1. Lower back pain and lower back pain with sciatica;2. Neck, shoulders and upper back;3. Hip and upper leg;4. Knee, ankle, foot (or any other lower limb problem);5. Wrist, hand, elbow (or any other upper limb problem);6. Trauma, multiple conditions and other.

4.3.7. Initial data analysis

The data was nominal data and labels attached to each covariate for analysis purposes in SPSS version 21. The data violated the tests for normality and the data was analysed using non-parametric tests for analysis of significance. Due to nature of analysis required for statistical significance and the high prevalence and incidence found, it was decided that the descriptive data provided the most reliable information. These were analysed using a commercial analytical tool, Tableau version 10, and summarised in chapter 5.

4.3.8. Sickness absence

Sickness absence data were limited to Company A and Company D (chapter 5) as Company B and C, did not robustly record sickness absence data.

4.3.8.1. Company A

Limitations found in the data from Company A were:

- Actual population averages could not be established;
- Considerable variances arose in recording year on year suggesting input inaccuracies;
- One day's absence could equate to 7 or 12 hours;
- No standard coding (reason) existed;
- Long-term absence was recorded on return to work resulting in a point prevalence under reporting of incidence and days lost;
- Prevalence of covariates were not recorded.

4.3.8.2. Company D

This organisation adopted a totally new way of working from August 2016 with the introduction of a new HR database. The system relies on the employee recording the absence and the absence being authorised by an employee's line manager. Compliance relating to utilisation improved during the year. The software had limited "reason for absence" categories and a full ICD match could not be achieved resulting in the possibility that some MSDs may have been "hidden" in another category (e.g. other-other). After the removal of this category and the ongoing compliance management programme being operated by Company D the data from this organisation appears more robust but not without flaws as outlined in chapter 5.

4.3.9. Other data limitations

There were a number of issues identified with the retrospective data including:

- Potential variations in the information recorded in relation to management referrals due to differences in the organisations' policies, procedures and contracts with the provider(s);
- Differences in the rules of the healthcare plans (albeit that these did not affect prevalence and incidence) but could potentially impact on cost (although across the organisations this was not apparent);
- The possible variances in the interpretation of a claim and hence prevalence, incidence and cost for the healthcare plans was based on claimant – which should be consistent;
- Considerable margin for error in relation to the recording of weight due to the subjective nature of the data requested via the telephone;
- Inconsistencies in responses from individuals reporting levels of activity and variations in understanding of the case managers in assessing the data provided;
- Recording of psychosocial factors in text fields, which could not be retrieved easily;
- Prevalence of alcohol and drug use appeared under reported.

4.4. Methods – Study 1b

The case managers of the IHMP who provide the administration and management services for the participating organisations were asked to provide cases for review from the six-year period spanned by the quantitative data. The cases selected (n=13) from hundreds viewed over the period of this research, provide a purposive sample that reflect the aim of this thesis and highlight the complexity of issues that can arise in case study research (Yin, 2014).

4.4.1. Data sources

The documents accessed and analysed (Table 9, page 84) were all authentic documents where the source and purpose was known and where consent to access such data for research purposes was held by the provider. The process that followed aimed to identify: any data that was meaningful to the individual case study (chapter 6); pertinent to triangulation of the data in study 1a; provided data consistent with this thesis and/or identified what further data would enrich the dynamic and evolving process of this research project.

Table 9: Documents accessed and analysed

Document type	Content	Method and format
Sickness absence records	Number of episodes; Reason; Length of absence.	Computerised record printed out.
Management referrals forms	Reasons why the line manager wished to refer the individual; Initial assessment of employee; Audio files of conversations with case manager and line manager and case manager and employee and associated report.	Portal record printed out.
Job profiles	Physical and psychological risk and task assessments.	Email attachment printed out.
Physiotherapy assessment/s	Telephone triage; Face-to-face assessments; Treatment reports and outcomes.	Audio recorded call listening; Email attachment or hard copy printed out.
GP Records	Fit note; Clinical notes; Treatments; Drugs; Reports and clinic letters from specialists.	Letter with report printed out.
Diagnostic assessments	X-rays and MRI scans.	Copy of assessment and any analysis printed out.
Specialist reports	Consultant orthopaedic and neurological opinions and reports including any proposed or actual surgical or pharmacological interventions.	Letter and report printed out
Private healthcare plan claims	Type and cost of claim supported by any clinical evidence.	Computerised records and any supporting clinical information in hard copy printed out.
Income protection claims	Type and cost of claim supported by any clinical evidence.	Hard copy reports from insurance company and any clinical information supporting claim printed out.
DSE and Vehicle assessments	Provision of information where work “tool” is causing a MSK problem – individuals self-report of issue collaborated by managers’ report. Information on: type of desk, chair, vehicle including dimensions of vehicles and anthropometrics of individuals where face-to-face assessment undertaken.	Email or hard copy report from physiotherapists/corrective exercise or ergonomist printed out.
Functional capacity assessments	Findings from assessment of function report including results of all tests conducted.	Detailed report hard copy printed out.
Functional rehabilitation reports	Results of any physical tests conducted. Progression of exercise and improvements in function. Psychological assessment to include psychosocial flags.	Detailed report hard copy printed out.

Table 9 continued: Documents accessed and analysed

Document type	Content	Method and format
Wellbeing assessments	Provision of lifestyle data from a face-to-face assessment to include functional movement screen if conducted but normally height, weight, blood pressure.	Detailed report hard copy printed out
Occupational factors	Ability to work with condition; Modifications of duties; Issues around age, gender or psychosocial factor e.g. grievance/perceived injustice; Notes relating to meetings with managers.	Various emails and reports in different formats and printed out
Case manager notes	Summary of complete history of case and actions.	Computerised record printed out

4.4.1.1. Research questions

The purpose of the initial retrospective study was to identify prevalence and incidence of musculoskeletal disorders in the working population of four participating organisations. It was accepted that this data would not provide any information on causation, patient experiences and interaction with the practitioners. This retrospective qualitative study was based on complexity and utilised the freedom of a bricolage approach to the data. In particular, it was important to explore how the qualitative data confirmed or explained the quantitative results and understand the extent of how:

- The documents contributed to the understanding of MSD incidence and severity;
- The symptomatic individuals believed about their condition, diagnostic process and treatment;
- Personal risks were evident, considered, understood and addressed if relevant to the MSD;
- Practitioners considered each case when assessing and treating these individuals and whether this varied by type of practitioner.

4.4.2. Individual case characteristics

Individual cases vary tremendously in complexity and may be categorised in many different ways. The studies included comprise a mix of cases that are straightforward and others that are more complex. The criteria used for a complex case are those that have one or more of the following features:

1. An MSD, that has or is likely to continue for more than one year; has one or more psychosocial factors, which is potentially maintaining an illness;

2. The individual is overweight or obese; inactive; or is active and the activity has caused or contributed to the musculoskeletal condition (e.g. swimming and shoulder conditions);
3. The individual has made (or likely to make) an income protection or employer's liability claim or grievance;
4. The individual is engaged in work that is safety critical; there is a requirement to achieve a certain level of fitness to be able to return to work and/or work has or is likely to cause the MSD;
5. Comorbidities exist increasing the complexity.

The number of cases chosen were limited due to the restrictions of this thesis and the volume of data accessed. The thirteen cases were selected to represent three varying job types: pilots; engineers and office workers and an example of how practitioners can ignore psychosocial risks.

4.4.3. Data analysis

The documents were all authentic and secured within an information technology system which could not be tampered with. The process involved downloading the documents from the case files, printing each document (where these were not audio files), understanding the purpose of the documents in relation to the employee benefits provided (e.g. sickness absence or claim on the healthcare plan), the authors (e.g. GP/physiotherapist/specialist) and the timeline. The content of each document was explored and significant information highlighted (Bowen, 2009).

4.4.3.1. Data analysis model

The data analysis model is based on the biopsychosocial influences as outlined in chapter 3 but modified to include the covariates outlined in this thesis and the possibility that these may be causative or confounding risk factors as outlined in Table 10.

Table 10: Data analysis considerations

Risk	Purpose	Implication
Understanding the presence of any biomechanical or biological issue.	Identify whether any biomechanical issues had been addressed or any physical factors considered.	Failure to assess these are likely to affect outcomes of any treatment plan in the longer term.
The clinical diagnosis and treatment plan.	Identify what has been taken into account and what treatment is being offered and why.	The diagnosis may not be the causation and the treatment plan may fail to address the issues.
The onset of the initial problem, the frequency of any ongoing flare ups and any associated triggers (physical or psychological).	It is important to know what has been considered.	An important physical or psychological factor could have been missed and be relevant to treating the person in the longer term.
The success or otherwise of any previous treatments.	To establish what has worked and to what degree.	Continuation of treatment that does not resolve the problem for the patient increases psychological factors.
Any underlying pathology (e.g. diabetes).	Whether this is potentially relevant.	May misdiagnose.
Age and gender.	Identification whether the condition is or is not associated with either factors rather than assume this is the case.	Issues associated with ageing and gender can be addressed with the correct advice.
Weight (under, normal, overweight or obese).	Whether underweight may be causing problems due to MSK system not being nourished or understanding the extent of any excess load on the system.	Ignoring weight is not helping the individual where this could be a factor.
Activity (inactive, active, very active) – to include frequency, type, intensity and duration of exercise.	Extremely important to the health of the MSK system importance to establish either way and to understand if this is being addressed.	Individuals are unlikely to understand the importance of this on the MSK system and ageing unless they are made aware. Implications for all.
Strength and conditioning (frequency, type, intensity and duration).	Integral to MSK health and need to understand whether this is considered.	Individuals are even less likely to know of the importance of this unless told.
Other lifestyle factors.	Smoking and excess alcohol has a part to play in MSK health.	Individuals need to be made aware where applicable.
Presence of psychosocial flags: attitudes; beliefs; fears; compensation; behaviours. conflict; work and influences of significant others.	Need to understand whether these factors are considered, understood and treated.	Presence of negative factors often drive behaviours and individuals could actually be causing more harm.
Ethnicity and culture.	Need to understand whether considered.	Some individuals experience pain more than others and this requires a different approach.

Table 10 continued: Data analysis considerations

Risk	Purpose	Implication
Nutrition.	Need to understand whether considered.	People need to understand the importance of nutrition for MSK health.
Work.	Consideration of the type of work and the hours and also whether the individual enjoys their work or under and physical or psychological pressure.	Work may be a causative or contributory risk or the MSD may impact on ability to work. If issues are not addressed then an individual may require alternative duties; retire or be dismissed on capability.
Sport/hobbies.	These could be a causative or contributory factor that should not be ignored.	An individual needs to know how to counteract any issues caused.

Each case was summarised in a high-level case synopsis identifying the relevance of any of the features outlined (or other possible “elephant in the room”) considering interpretative phenomenological analysis (Smith, Flowers & Larkin, 2009) and what factors had or had not been considered by any practitioner involved in the assessment and treatment of the case. For clarification of the issues that can arise, some of these cases have been summarised in more detail than others to highlight the complexity of possible underlying cause and contributory risk factors and to explore whether these were considered by clinicians involved in assessing not treating the individual.

4.4.4. Ethics approval

Additional Qualitative Analysis of Documents Relating to the Musculoskeletal Cases Reviewed in the Quantitative Study (Ethics Approval 757/13/PG/CS) and the Qualitative Study (Ethics approval 874/14/PG/CS).

4.4.4.1. Ethical considerations

The quantitative data are such that individual sensitivities are reduced providing the guidance issued by the Information Commissioners office is followed to ensure compliance with the Data Protection Act 1998. Commercial sensitivities do need to be taken into account and the four participating organisations have been designated Company A, B, C and D with broad industry categorisation. The document analysis is the most sensitive and although every effort has been made to protect confidentiality it is possible that individuals could be recognised from the case studies. Although written or informed consent has been obtained it is still necessary to protect such sensitive data. Such information is only provided for the purpose of this thesis and would not be published in the current format.

4.4.5. Limitations

The documents accessed do not fit the standard primary types (within document analysis) as outlined by O’Leary (2014) in that they are neither public records, personal documents in the first person or physical evidence, nor was the intent to analyse these documents for themes (Bowen, 2009). Instead, the intent was to use the basis of the BPSM as outlined in chapter 3 and to extend this framework to incorporate the covariates studied in this thesis in a manner that clearly defines the multifactorial and multidimensional factors evident within the data and underpinned by bricolage.

4.4.5.1. Conformance and rigour

The data accessed includes that which may be used in what is termed a retrospective chart review (RCR) or medical records review (Vassar & Holzman, 2013) and also includes audio files of discussions between symptomatic individuals and physiotherapists which could be said to form part of this same data type. For clarification, although this type of data was used within this study it was not intended that a RCR would be conducted but instead the data would be used to help qualify what was identified in study 1a, and to help direct any further qualitative studies. Methodological considerations for RCRs as outlined by Vassar and Holzman (2013) appear to focus on the use of such data for quantitative studies but were regarded as part of this process (Box 4):

Box 4: Methodological considerations

Criteria adopted
<ul style="list-style-type: none">• Development of the research questions to aid in the understanding of what data would support the intent of this thesis;• Initial large sample of cases, selected randomly by the case managers which were then reviewed by the author from which a specific number of cases were selected as examples of complexity, simplicity and occupational issues rather than these cases being selected to suggest that the findings were representative of a population or risk factor;• Ensured that the variables were recognised and understood and which is one of the main points of this thesis;• Use of standard data extraction method and format was governed by standard operating procedures from an electronic database whilst recognising the limitations and issues of interpretation and bias from individuals involved in the management process;• All documents have been included and no document excluded as this then provided a greater understanding of the data;• Coding or interpretation issues are discussed under the limitations for each study and within the analysis;• Confidentiality and ethical considerations are a concern and have been accounted for the purpose of this thesis but specific data will be redacted for publication.

Data recorded by the case manager are an interpretation of discussions involving the symptomatic individual, the line manager or HR manager and internal colleagues. The data included information on job type, sickness absence, performance and many other occupational related factors, which in themselves will also include multiple interpretations of the case and may be influenced by other policies or views from the management of the employing organisation.

4.4.6. Data analysis.

The approach is deductive and inductive (Fereday & Muir-Cochrane, 2006) in nature in that it aimed to consider the philosophical framework which incorporated the BPSM and the themes that emerged from the participants. Weighting the significance of that data to each individual is fraught with the complexity of interpretivism and associated symbolic interactions and modern hermeneutics, (Crotty, 1998) all of which are inherent within the psychosocial model and combine with medical anthropology (Fetterman, 2010).

The conclusions drawn are those that are personal to the author after more than thirty years of working in the healthcare industry and not easily replicable unless analysed by an individual with similar working experience of the issues raised. To test for personal bias, the cases were discussed with individuals who also specialise in this field (or an associated field where relevant to a case). The summaries reflect the opinions of the various practitioners involved from which the author has drawn conclusions of the meaning to provide an understanding of what factors may be present.

4.5. Methods – Study 2

This prospective study aimed to recruit symptomatic individuals from the four participating organisations and aimed to identify:

- What the individuals understood about their MSD including: the possible affect of: weight (under or excess); activity (inactive or very active) and other lifestyle or psychosocial factors;
- Their experiences with practitioners and treatment.

4.5.1. Data sources

Recruitment of the symptomatic individuals included:

4.5.1.1. Recruitment of the focus group

A request to conduct a focus group (Silverman, 2011; Cronin, 2013) for research purposes, was made to each of the participating organisations but three of the four organisations thought that these would be difficult to arrange and were concerned how these would be perceived by the symptomatic individuals.

Company D identified a group of nine technical service engineers, who were long-term complex MSD absentees, who they thought would be quite vocal about the impact that their illness had on their work and home life. A senior manager contacted each individual separately and asked whether they would be prepared to participate in the focus group. He provided those interested with the PIS and the consent forms. As part of the initial part of the introduction the author restated the purpose of the meeting and collected the consent forms to ensure that everyone was comfortable with discussing sensitive personal data with others.

4.5.1.2. Recruitment of symptomatic individuals

Case managers of the service provider were asked to identify individuals who would be willing to participate in a research interview (Fielding & Thomas, 2011). This was initially offered to individuals during a telephone call and those that were interested were sent a letter of invitation, the PIS and a consent form. The author then confirmed consent over the telephone before proceeding.

4.5.2. Consent

The participants within the focus group each signed a consent form as outlined above. The symptomatic individuals agreed to informed consent by telephone and participation in the research following receipt of the PIS and a conversation with a case manager outlining the purpose of the research, how the data would be stored, used and reported upon. A consent form was also held by the provider in relation to accessing medical records and which included a statement that the data may be used for research purposes.

4.5.3. Topic guide

An information guide was provided to the participants on the purpose of the research and to stimulate discussion within the focus group and the direct individual interviews, using open questioning techniques, when and where necessary (appendix 4).

4.5.4. Methods used

Data were collated as follows:

4.5.4.1. Focus group

The guidance for the format of the focus group followed the method outlined by Silverman (2011) and Cronin (2013). The meeting took place in a hotel conference room (neutral location) and scheduled for three hours, with a break for food and drink. The first session involved asking each participant to provide information about themselves, their medical condition, experience of the various treatments they may have undergone and the outcome for them. A group discussion (using the principles of the topic guide), then ensued about their understanding of possible causative and contributory risk factors and was documented by audio recording and note taking. The second session involved observation and note taking whilst a musculoskeletal specialist used a number of presentational aids to support a myth busting element (to help individuals feel they had gained something from the session) which encouraged participants to engage actively in certain activities to feel or observe how the body functions. The data were enriched from discussions with the managers about the issues faced on returning the individual to work including the tasks undertaken by each individual and how these could be modified and for what period to enable a phased return to their normal duties having been absent on average for nine months.

4.5.4.2. Symptomatic individuals

The telephone interviews with the participants were of ninety-minute duration and were guided by the information from Fielding and Thomas (2011). The data from the telephone conversations were supported with: recorded notes from the integrated health management database by the case manager; data from audio recording of conversations the individual had with a physiotherapist (where applicable) and from any associated case notes or clinical reports (e.g. GP and/or surgeon).

4.5.5. Additional research questions

In addition to the initial research questions outlined it was decided that further insight might be gained from a request to understand the following:

- What do the employees feel is the cause of the musculoskeletal disorder?
- What effect, if any, does occupation; social activities; personal risks or some other construct have on their condition?

- Who do the symptomatic individuals think can help them, is it: the NHS; a specific type of clinician; their employer; an exercise or other non-clinical practitioner or themselves?

4.5.6. Ethics approval

Qualitative Study and Analysis of Data from Symptomatics Individuals (Ethics Approval 875/14/PG/CSN).

4.5.6.1. Ethical considerations

There are a number of ethical issues that arise in practice when dealing with symptomatic individuals. From a research perspective there are issues associated with confidentiality and the processing of sensitive personal data as governed by the Data Protection Act 1998 and guidance issued by the Information Commissioners Office. As a researcher it is important to be cognisant of any sensitive issues especially within a focus group where data are being shared in an open forum and where an individual may feel under pressure to disclose information that they may later regret. It is also important to recognise that although consent either written or verbal may have been provided that an individual has the right to withdraw this consent. A further issue observed as detailed in the case studies is that language used, normally by practitioner can be interpreted in such a manner that this may cause harm to the individual. The issues associated with this are discussed in chapters 2, 3, 6, 7 and 8.

4.5.7. Data analysis

The methods used to analyse the data was that which was used in study 1b, as outlined in Table 10 (page 87) and which modified the biopsychosocial approach as outlined in Table 11 (page 94) to include the depth of data available from the documents and accounted for what symptomatic individuals may be able to recall as guided by the topics raised during the sessions. It should be noted that not all of these factors could be established for every individual but as a minimum it provided a framework for discussion and a template for the analysis.

Table 11: High level coding of modified biopsychosocial issues

Name of main code	Assessed (where relevant)	Considered/treated
Age	Speed of ageing	Advice on improving strength and flexibility with exercise.
Gender	Any gender specific issues	Addressed accordingly.
Occupation	Work tasks and hours	Advice on exercise to counteract work stressors and also to aid phased return.
Biomechanical issues	Functional assessment	Corrective exercise.
Weight (Under/Excess)	Impact	Weight improvement.
Activity/Exercise/Strength and Conditioning	Type/frequency/duration and intensity	Advice on increasing or decreasing.
Sport/hobbies	Implications of sustained postured or other functional issues	Advice on how to address.
Other lifestyle factors	Smoking /alcohol/drugs	Advice on impact and how to change.
Psychosocial flags	Yellow/Orange/Blue/Black as detailed in chapter 3	Demonstration that advice given or referral to address made.
Ethnicity and culture.	Language and vulnerabilities	Treatment plan adapted.
Nutrition	Considered in association with weight/exercise/ and other diseases	Treatment plan to include diet & nutrition where appropriate.
Diagnosis	Considers range of factors not just clinical presentation	Advises on multiple causation.
Treatment plan	Includes clinical and non-clinical	Monitors progress of both and adapts.
Previous treatments/outcomes	Does not ignore outcomes	Avoid repeating treatments that have not worked.
Underlying pathology	Implications considered	Addressed as part of treatment plan.

The data was summarised as individual high level case studies (Yin, 2014) and in a thematic analysis format (Braun & Clarke, 2006, 2013) but using the main covariates identified in this thesis. From a theoretical perspective which links to the biopsychosocial nature of the analysis, understanding how these individuals viewed their world and their condition was important and how these could maintain or influence their illness is identified where relevant in the cases summarised in chapter 6 and 7. The relevance of age, gender and the modifiable risk factors across the thirteen case were outlined including identification of the psychosocial categories and whether these had been identified by the practitioners treating each individual was included.

4.5.8. Limitations

The following summary outlines the key issues found from the data collection process in this study.

4.5.8.1. Data coding and analysis (study 1a)

The data coding was developed from a modification of the BPSM. Within each heading it is possible to explore the depth of each risk based on the individual characteristics of each symptomatic individual. However, one of the aims of the research was to understand whether these factors are considered by practitioners. The findings from the three qualitative studies suggest that in general from the document analysis, the focus group, and one to one interviews these potential causative or contributory risks are not assessed or addressed and hence any detail relating to the cases in this study are provided within a simplified case study which considers rival explanations (Yin, 2014). The information chosen reflects the author's view of the range of possible issues that may contribute to the MSD and how the individual copes with their illness. The limitations of a single interpretation and the possibility of other explanations have been discussed with colleagues who specialise in one or more of the covariates, and the analysis aims to reflect issues of interpretation. When analysing data associated with people and a medical condition, and in particular an MSD, then the data are open to varying interpretations consistent with clinical and non-clinical reasoning, training and experience.

4.5.8.2. Focus group (study 2)

A problem identified with the focus group conducted was that some individuals (six individuals) were more vocal than others, which minimised the data gained from the three quieter participants. The individuals were employed in the same occupation and hence their job type was similar and their beliefs had emerged from the many years of working in a similar occupation and what the individuals performing these tasks and the trade union believed were the issues. Whilst the views expressed in the focus group were (and are) consistent with other individuals in similar job types there was a natural bias and constructionist presentation. During the second session with the musculoskeletal specialist in attendance all participants appeared to respond to the introduction of knowledge from an expert and accepted that their perception may not be the reality.

4.5.8.3. One to one interviews (study 2)

The individuals in this study were recruited by different case managers, employed by different organisations and in had varying roles and one was a dependent of a member of the healthcare plan. It is possible that this group of individuals were those that wanted to express a point of view and/or thought by participating in the research that they may learn more about their condition or be able to benefit from the research in some way in the

future. It was accepted that there may be the potential for bias but any issues identified especially any variance in their subjective view compared with the opinion of any practitioner involved in the case is discussed in chapter 6. The main bias identified was that associated with the individuals may have wished to express their views (for reasons unknown) or presented what they think the author wanted to hear rather than it be a true reflection of what exactly happened and when. Where possible this data was compared to the views of the practitioners.

4.6. Method – Study 3

The individuals who participated in this study were recruited via the following approach:

- They were (or are) employed by the IHMP and as such should have a good understanding of the BPSM;
- Are used as providers by the IHMP due to their knowledge and experience of the broader multifactorial issues and again it was expected that these practitioners would know more than practitioners who are not actively involved in assessing and treating such phenomena;
- Are known to have treated individuals known to the IHMP.

These individuals were emailed or telephoned and forwarded the participant information sheet attached in appendix 5. The service provider was asked to provide the names of practitioners who had:

1. Assessed and treated individuals in Study 1b or Study 2.
2. Were used as independent practitioners to review any of the cases.

An initial list of possible participants was identified with whom the case manager had spoken. A letter of invitation and participant information sheet was sent to the list of practitioners. As these practitioners should be familiar with conservative pathways and self-management of the possible multiple underlying risk factors the intent was that they would provide a benchmark for those most likely to use a multidimensional approach compared to those that may rely purely on a singular strategy consistent with their original training. The data from these practitioners was considered alongside other practitioners, contracted by the service provider and local NHS physiotherapists. A topic guide (appendix 4) was developed to prompt discussion during the direct face-to-face practitioner interviews.

Further practitioners were involved in providing insight via other different methods and informed of the purpose of this research included conversations to discuss:

- A specific case identified in chapter 6 or 7;
- The general nature of the provision of physiotherapy;
- The need to change the way in which musculoskeletal services are delivered;
- The training of physiotherapists in university.

4.6.1. Methods

Data were collated by different methods and from a variety of sources (Table 12).

Table 12: Method of data collection and source

Method	Data source
Semi-structured interviews (90 minutes) in an office location or clinic setting.	Practitioners.
Meetings and discussions (varied length and places).	G.P.'s; NHS commissioners; Providers of musculoskeletal services (NHS & private); FRP providers; FCA provider; Wellbeing providers.
Case specific conversations (telephone and face to face and varied in length).	Physiotherapists; Physicians; Surgeons.
Training (Osteopathic Association Clinic London for BIMM and various other office and clinic locations)	GPs; Physiotherapists; Case managers.
Listening to recorded calls	Physiotherapist and patient; Case manager and patient; Case managers and line manager/HR/ER.

4.6.2. Evolution of the data collection process

The initial intent was to rely on one to one interviews with practitioners but during this phase of the research it was found that further more robust data could be obtained by less formal meetings and conversations. The data collection process included: one to one interviews; case specific telephone conversations or face-to-face discussion; ad hoc case specific questions to practitioners; meetings and general discussions about the issues relating to the increase in MSDs and possible causation and prospect for change.

The data found from the document analysis and the one to one interviews was used to inform study 3. Whilst there were consistent themes emerging in relation to the intended

framework which has guided the research questions and the data analysis, new data emerged relating to the views of practitioners and the challenges they face when dealing with the range of symptomatic individuals and the benefits provided to them as discussed in chapter 8.

4.6.3. Purpose

To understand the views and experiences of the various clinical and non-clinical practitioners involved in the prevention and management of MSDs and in particular when dealing with symptomatic individuals including:

- What do practitioners take into account when assessing and treating these individuals across the various occupational services and benefits? Does this vary by type of practitioner?
- Do they assess: pain/symptoms; other medical conditions; psychosocial; excess weight; type, frequency and duration of exercise; strength and conditioning for purpose; sport or hobbies; nutrition; occupation or any other risk factor?

4.6.4. Ethics Approval

Qualitative Study and Analysis of Data from a Practitioner's Perspective (Ethics Approval 874/14/PG/CSN).

4.6.4.1. Ethical considerations

The practitioners may not be prepared to either discuss any detail relating to how they personally practice or what they feel about other practitioners. They may also be sensitive to what they mentioned about patients. From a research perspective it is important to respect any confidentiality as governed by the Data Protection Act 1998 and any medical ethics and codes of conduct. Processing any sensitive personal data are important as outlined above and any commercial sensitivities also have to be respected. These sensitivities are discussed where relevant.

4.6.5. Data analysis

A summary of the specific views of practitioners and any of the individuals involved in the management of MSDs is outlined in chapter 8 as high level case reviews (Yin, 2014) and a thematic analysis (Braun & Clarke, 2006). The responses provided were then compared in more detail to the research questions as guided by the framework outlined in Table 11. The data from the practitioners and individuals involved in the management of MSDs

provided pertinent information on the interactions between the various should be considered to improve current practice.

4.6.6. Data limitations

The information gained was mostly from individuals who have an understanding of the BPSM. This should have meant that a good understanding of this model and the multifactorial issues would be evident but this was not the case across all practitioners but was present in those that specialised in functional rehabilitation. The information gained on the knowledge of the practitioners on other possible risks (e.g. exercise) was also based on their training and as such the data cannot be extrapolated to all practitioners but it is believed that the triangulation of the data means that the combined data are reflective of the practice of many.

Also evident was that certain practitioners in the formal interviews appeared to postulate a viewpoint based on what they thought the researcher wish to hear and that their comments were not necessary reflected in practice (e.g the problems associated with excess weight and inactivity).

4.7. Conclusion

The methods used across the four parts of this research aimed to combine quantitative data to identify the “what was happening” whilst the qualitative data may help further our understanding of the “why” so many individuals suffer from MSDs. The data collection method and its analysis across the studies are consistent, suggesting that the data are reflecting prevalence, incidence, perceptions and reality and intended to provide insight to prompt further research.

PART 2 – Quantitative and Qualitative Findings from the Data

Chapter 5

Study 1a

Quantitative Data Analysis of Employee Benefits

5. Introduction

This retrospective study considers the quantitative data from four participating organisations, incorporating information from the provision of various benefits provided to employees and where applicable to significant others (e.g. dependents covered on a Healthcare Plan). This study specifically relates to collation and analysis of data relating to the assessment and treatment of MSDs in terms of both incidence and where known the cost to the organisation. It aims to identify the presence or otherwise of a range of other risk factors including: age; gender; work type; psychosocial aspects; excess weight; inactivity; smoking and excess alcohol consumption, albeit that the latter two risks are then excluded from scope for any further analysis for reasons of brevity.

5.1. Purpose

The aim of part 1, of study 1, was to identify the prevalence and where possible the incidence of MSDs across the various employee benefits and to what extent the identified covariates were present in symptomatic individuals. Data are limited to UK incidence and cost in Table 13 (page 102).

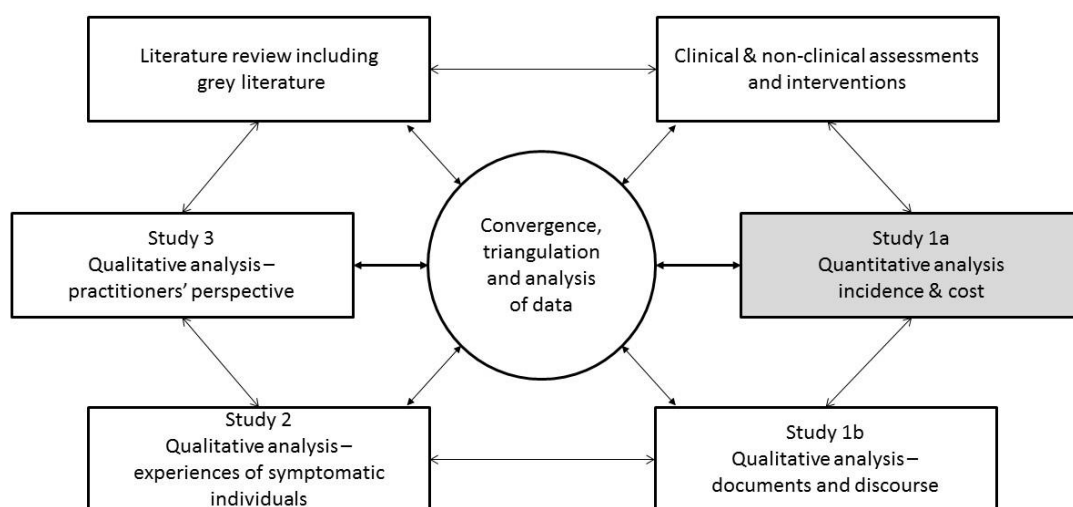


Figure 6: Explanatory sequential mixed methods research design – Phase 3

Table 13: Data accessed per organisation but not necessarily quantified

Health Activities	Company A	Company B	Company C	Company D	Data Quantifiable
On-Employment	Yes	Yes	No	Yes	No – insufficient information
Sickness Absence	Yes	Only started recording late 2016	Absence data limited	Yes	Yes
Management Referrals	Yes	Yes	Yes	Yes	Yes
Work Relatedness	No	Yes	Yes	Yes	Yes
Healthcare Plan/s claims	Yes	Yes	Yes	Yes	Yes
Treatment outside HCPs	Utilised occasionally but data not accessible	All corporate employees in HCP	Not apparent this was used	Yes	Yes
Group Income Protection/ Incapacity claims	No person accessed during period of study	No	Yes	Yes	Yes
Employer's Liability claims	Not made available	Not known whether any claims made during study period	Limited access to cases	Yes	No – data with detailed information not made available
Wellbeing Assessments	Yes	Yes	Benefit not provided	Yes	Yes
Vehicle Assessments	Yes	NA	NA	Yes	No but addressed in qualitative data analysis
DSE Assessments	Data not made available	A few	Data not made available	Yes	No but addressed in qualitative data analysis
Fitness to Fly Assessments	NA	NA	Unable to access the AME medicals for Pilots and Cabin Crew	NA	No but addressed in qualitative data analysis
Modified duties	Not known	Not known	Not known	Estimated 800 employees but data not recorded and therefore not quantified	No but addressed in qualitative data analysis

5.2. Analysis of sickness absence

The following observations are a summary of the key findings from the two organisations (Table 14, page 106).

5.2.1. Prevalence

The data suggests a disparity between the two organisations in terms of prevalence but this may be due to flaws in the data that could not be clarified with Company A as outlined in chapter 4.

It is surmised from conversations with Company A is that the data recorded is strongly biased towards the manufacturing aspect of the business where both incidence and severity varies significantly across the various sites and during different times of the year. This participating organisation stated that office based staff, when combined with sales and marketing, accounted for circa 50% of the population, whom they believed did not record absence on the system. A four-year analysis of data per employee (employed) suggested a sickness absence incident rate (all conditions) of: 5.2 days per employee for production; 3.5 days per employee for field and 2.7 days for office based. This concurs with the HR viewpoint and may be representative of closer management in production and field-based operations compared to office staff where sickness absence is not as business critical.

The number of days lost per episode at fifteen days for both organisations possibly reflects comments made by practitioners interviewed in that they speculated that a GP would sign a person “off sick” between two and four weeks on average.

5.2.2. Cost of absence

The cost of MSDs at 21% for Company A and 25% for Company D appear more aligned. The average cost per day is slightly lower than Company D but could be consistent to the variance in time periods and the average salary in each organisation. The cost of MSDs to both organisations outranked that of any other single condition including mental health albeit that mental health was very similar in terms of total days lost due to the higher average length of absence per episode.

5.2.3. Incidence by musculoskeletal body area (grouped)

The prevalence of sickness absence was grouped into five main body areas but comparability was difficult due to the random nature of the manner in which employees could record data on the Company A system.

Back pain (the most comparable) reported for Company A and D 45% and 49% respectively, whilst lower limb including foot and ankle (often not reported in literature) when combined with knee problems accounted for 15% of Company A and 32% of Company D.

The employed population of Company D includes around 12,000 engineers, compared to circa 120 within Company A, which may account for the high prevalence in Company D as the engineers use their lower limbs, during their working activities and the extent of time spent kneeling has been the subject of study by Intel Data Center Solutions. Whether the time spent is greater than Company A employees, whether they are older or have been performing the tasks for longer could not be established.

Neck, shoulder and upper back ranked the third highest reason for musculoskeletal absence (19%) in Company D, which again could be associated with the work of the engineers due to their involvement in lifting, twisting and stooping.

Field Operations, which includes the engineering population, is responsible for 72% of the musculoskeletal absence episodes compared to 28% for customer operations. When compared to an incidence based on the numbers employed then field operations had an incident rate of 3% compared to 2% ($p < 0.0001$) for the office-based roles in customer operations. Length of absence was also slightly longer (circa 3 days) which would be consistent with a return to a manual role.

5.2.4. Gender

More males tend to be absent than females but this appears to be in proportion to the higher number of males employed within the organisations and the possible under reporting in the office environment where the population in these organisations were skewed towards a higher number of female employees. Data collated for Company D (January to December 2017) did suggest that males in the 30-39, 40-49 and 50-59 age groups had a 14%, 18% and 13% retrospectively higher incidence than the male population employed in those categories whilst females in the 20-29 and 30-39 age category had a 50% and 30% lower incidence than the population of females employed.

5.2.5. Age

The highest incidence of MSDs was in the 30-49 age category but reflects the proportion of people employed in this age group. Actual incidence rate by age group could only be categorised for Company D where it was in proportion across all age categories, except for

a slight variance in the 50-59 category where incidence was 1.5% below that of the population employed.

Table 14: Summary of sickness absence incidence and cost

Topic	Company A (Jan 2011 to Dec 2014)	Company D (Aug 2016 – Jul 2017)
Average number of employees (estimated)	2200	30,000
Total absence episodes	1182 (cases managed)	29,668
Total number of MSK cases for period	536	4,287
Annualised average	134	4458
Percentage of overall number of episodes	6% of population and 42% of cases managed	14% of population and episodes
Number of days lost	8,280	65,276
Cost of MSK absence	£1,242,000	£11, 844,330
Percentage of overall cost of absence (based on days lost)	21%	25%
Average length of absence (days)	15	15
Cost per incident	£2,317	£2,763
Estimated annual cost of MSDs	£310,500	£12,080,398
Musculoskeletal Body Area		
Lower back (with and without sciatica)	45%	49%
Neck/shoulders/upper back	8%	19%
Hip/Upper leg	3%	Not defined
Knee/Ankle/Foot	15%	32%
Wrist/hand/elbow	5%	Not defined
Trauma, Multiple and other	24%	Not defined
Covariates		
Excess weight/Obese	Missing data	71% (45% overweight & 26% obese)
Inactive	86%	75%
Smokers	8%	11%
Exceed alcohol guidelines	16%	13%
Job Role		
Active (Job role involving shift work)	87% (74% production & 13% engineers)	73% (engineers)
Sedentary	13%	27%

Table 14 continued: Summary of sickness absence incidence and cost

Topic	Company A (Jan 2011 to Dec 2014)	Company D (Aug 2016 – Jul 2017)
Gender		
Male	97%	88%
Female	3%	12%
Age Group		
<19	0	0.32%
20-29	1%	15.8%
30-39	16%	33.3%
40-49	38%	22%
50-59	24%	23.7%
60-69	17%	4.7%
70 plus	1%	0
Unclassified	3%	0

Company D data was more robust and actual population known. Table 15 identifies that the Field Operations, which encompasses the engineering population is responsible for 72% of the musculoskeletal absence episodes compared to 28% for customer operations. When compared to an incidence based on the numbers employed then field operations had an incident rate of 3% compared to 2% ($p < 0.001$) for the office-based roles in customer operations. Length of absence was significantly higher ($p < 0.001$) which would be consistent with a return to a manual role.

Table 15: Company D sickness absence Incidence by job type

Incidence	Field Operations (Engineers travelling to customer premises)	Customer Operations (office based)
Percentage of overall population	47%	27%
Overall MSK incidence rate per employee employed	3%	2%
Percentage of MSK episodes	72%	28%
Number of days lost over 50 weeks	49252	10741
Average length of absence (days)	16.49	13.23
Cost	£8,936,775	£1,948,954

5.3. Management referrals

These referrals normally arise from line management but Company C used HR to reduce the referral rate in the latter 2-year period. With Company D there was a direct link between sickness absence and case management in that a percentage of absence episodes would be converted into a case and as such are also shown under this category of ill health (Table 16).

5.3.1. Incidence

Management referrals for MSDs in the four participating organisations were the highest reason for referral from managers. Most referrals were for new cases but on ongoing cases or reoccurring cases were not recorded in a manner that could be quantified.

The incidence for Company A and Company B was similar circa 32%-33%. Company C intentionally reduced their referral rate to reduce the case management and associated costs (e.g. G.P. and specialist reports). Company D referral rate for referrals received direct from management was 37% but if the cases were added that had been transferred from the first day sickness absence process then the number of cases managed for MSDs as a percentage of overall cases increased to 61%. This suggests that a considerable amount of cases that would normally go “unmanaged” in that either a manager would not refer them, they may remain absent for longer, they may be placed on modified or alternative duties for unspecified times or may access other benefits such as income protection. These suppositions arose when comparing the number of cases absent 30.5% of the population compared to number of cases referred at 8.5% in Company A.

5.3.2. Absence versus non absent referrals

Managers will often refer cases for management when an individual is absent but this is not always the case. Sometimes the referral may be associated with fitness to work or for consideration of any modifications of duties. The incidence of MSDs in non-absent employees was not recorded. Hearsay evidence suggested that a considerable number of employees had been placed on modified duties and some remained on these for years but such data could not be quantified as it was not recorded by any of the organisations.

5.3.3. Length of case

Comparing length of case is difficult, as the reason a case may remain open can be due to a range of factors including: complexity of a case; effectiveness of line manager; effectiveness of human resource and or employee relations; speed of diagnostic and or

treatment process (NHS or private); speed of access to medical information; and effectiveness of case manager.

5.3.4. Reason for referral

The data collected from management referrals may provide information not identified from the standard sickness absence reporting process. Management referrals are cases that a manager wishes to be assessed for different reasons including:

1. Fitness to perform a specific role;
2. Clarification of reason for illness and likely length of absence;
3. Whether any intervention will improve ability to work and in what timescale;
4. Consideration of suitability for a benefit e.g. group income protection or incapacity;
5. What modifications are required to maintain a person at work or whether the only remaining option is dismissal on capability.

The process normally involves a direct telephone or face-to-face assessment with the employee and may be supported by a GP fit note, GP letter, specialist report or independent clinical and non-clinical evidence. Frequency of obtaining objective evidence and was not recorded and whether this affected an outcome could not be analysed.

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Table 16: Management referrals for periods of data accessed

Management Referrals	Company A Oct 11 – Sept 15	Company B Oct 11 – July 17	Company C Oct 11 – July 17	Company D (Aug16 – July 17)
Volume of overall cases	873	1473	1953	3245
Total number of MSK cases	291	468	499	1209 (Plus 776 converted absence cases)
Percentage of overall cases	33%	32%	25%	37% (61% with absence cases)
Musculoskeletal Body Area				
Lower back (with and without sciatica)	36%	38%	34%	39%
Neck/shoulders/upper back	15%	10%	16%	15%
Hip/upper leg	2%	3%	4%	2%
Knee/ankle/foot	22%	23%	16%	25%
Wrist/hand/elbow	9%	11%	10%	8%
Trauma, Multiple and other	15%	15%	20%	11%
Covariates Missing data (excess weight	57%	61%	35%	29%
Excess weight/Obese	32%	24%	33%	50%
Inactive	77%	84%	71%	74%
Smokers	29%	22%	11%	14%
Exceed alcohol guidelines	8%	3%	8%	8%
Job Role			Missing 0.04%	Missing 0.6%
Active (Job role involving shift work)	Unknown	58.2%	65.5%	76.8%
Sedentary (Office)	Unknown	41.8%	39.5%	22.6%
Gender				
Male	229	37%	40%	83%
Female	62	63%	60%	16%
Age Group		Missing 0.43%	Missing 0.20%	
19-29	2.4%	0	0	0.15%
30-39	21.6%	10.6%	6.6%	14.5%
40-49	32.0%	26.5%	31.6%	23.6%
50-59	31.3%	18.5%	29.06%	23.6%
60-69	12.7%	14.5%	11.2%	5.19%
70 plus	0	2.14%	0.2%	0%

5.3.5. Group income protection (GIP) incidence

Case management of referrals from line managers includes the assessment and management of individuals who have access to GIP. Although Company D provided a benefit from June 2016 only one claim was made during this period due to a twelve month deferred period (the point at which an individual can claim on the scheme).

Data was available from Company C who offered a twenty-six week deferred period had forty-four musculoskeletal claims during October 2015 to February 2017.

Of these:

- 93% were male representative of the proportion of males in receipt of this benefit and pilots. An MSD could inhibit performance of safety critical tasks and render a pilot unfit to fly with availability of ground based duties minimal;
- 36% were in the 40-49 age category and 41% in the 50-59 category suggesting the possible increasing problems with fitness to fly and age;
- 37% were for neck, shoulder or upper back suggesting possible forward head posture associated with working in a confined space (cockpit) and modern day life (texting, using computers, driving) without counteracting the strain of these activities with exercise to alleviate the stressors;
- 20% were for lower limb involving foot, ankle, knee and lower leg problems including stability issues and tight muscles and tendons. Pilots sit for considerable periods and have to apply significant pressure to the controls but rarely undertake lower limb strength and conditioning exercises;
- 16% were for lower back, and significantly lower incidence than other occupations, suggesting that back pain may resolve or not impact fitness to fly to the same degree;
- 27% were recorded in trauma and or multiple problems and other which would include: fractures, sprains, strains, surgery and multiple musculoskeletal problems.

5.3.6. Work relatedness

Although musculoskeletal injuries and disorders, which are caused or made worse by work, should be recorded by all organisations this data were not made available. Causation should be easy to identify if the individual has suffered a musculoskeletal injury, from an accident at work. Incidents such as slips, trips and falls resulting in sprains and strains or

fractures are easy to attribute to the specific incident and often recorded. Investigations should establish whether the incident did *cause* the problem or whether there are other contributory factors but this is not always straightforward. Causation outside of a specific incident is more complex as common conditions such as LBP are normal and often associated with day-to-day use of the skeletal muscle system. Causation is then often multifactorial and includes personal risk factors such as inactivity, lack of strength and conditioning, excess weight and negative beliefs.

5.3.6.1. Objective analysis of perception and reality

The following information (Table 17) highlights the variance between subjective and objective measurement of work-relatedness. This data were only available from the sickness absence data of Company D (and not from any health and safety recorded information).

Table 17: Company D WRMSDs 15/08/16 to 30/06/17

Category	Cases	Comments
Absences logged	34,473 episodes	Verified by managers
Reported work related injury	501 episodes	Logged by employees
Reported work related illness	494 episodes	Logged by employees
Total	995 episodes	3% of total absence (incidence)
Objectively assessed (closed cases)	14,384 cases	Absences and referred cases
Actual work-related lost time	27 cases	1,273 total days or average 47 days per case
Non-lost time	7 cases	
Total	34 cases	0.001% of cases

The incident rate for all work related ill health, including perceived work related ill health, for Company D is 0.06%. Of this, WRMSDs account for 48% (compared to the HSE 39%). If the perceived category is removed, then this reduces to 24% or 501 cases out of a total of 34,473 cases of ill health or 2056 cases of apparent work-related ill health. The incidence per 100,000 of actual cases would equate to 167 for Company D based on the average population during the period. In relation to the length of work-related absence then there were 21 cases of lost time with an average of 74 days per case and 1,252 days in total for the period. The length of lost time absence for WRMSDs is 348% per episode higher than the average length of absence reported by the HSE (2016).

Although a small sample compared to the HSE data, the findings do prompt a number of observations: the HSE data relies on self-reports where perception and reality may be somewhat different but the HSE only report on perception and do not validate the subjective data and a clear comparable definition of what exactly is deemed to be cause or made worse by work appears vague. The HSE length of absence for WRMSDs is similar to MSK general absence and inconsistent with the presence of a “Blue and possibly Black” psychosocial factor which normally extend absence length (Kendal, et al., 1997). This could suggest that actual work-related absence may be longer than reported by the HSE.

5.4. Healthcare plan data

All four participating organisations operated a form of self-funding, where the benefits and rules of the plan are underwritten by what is known as a *Medical Trust*, a legal vehicle similar to a trust fund used for pension plans. As part of this approach, all organisations had introduced a form of *managed care* to assess and manage appropriateness of treatment and to encourage a degree of self-help. This was in response to the prediction of increasing incidence and the need to improve musculoskeletal health during the Bone and Joint Decade, 2000-2010 (Woolf, 2000) and beyond. Created by a group of orthopaedic surgeons in Lund, Sweden, in the nineties, who recognised that MSDs had been ignored by the medical profession, politicians and the public probably because they are considered to be a natural part of ageing and not life threatening (Woolf, 2000). The aim was for fifteen countries, the United Nations, supported by Secretary General Kofi Annan and the World Health Organisation, to collaborate actively and promote musculoskeletal health to improve health related quality of life.

5.4.1. Healthcare plan benefits

Private healthcare plan benefits are based on the medical model and have remained broadly unchanged for thirty years. They generally do not take account of the development of the psychosocial factors, the implications of excess weight and inactivity or encourage engagement in conservative treatment options (e.g. the FRP). The participating organisations, with the exception of Company B, had used traditional insurance companies to administer their healthcare trust, who are only able to administer the benefits and rules used in their general portfolio. The format of the benefits and rules may not reflect the most appropriate construct for the organisation and their people, limiting the opportunity to manage the underlying physiology. A stepped or matched care approach, that considers conservative clinical and non-clinical approaches prior to clinical intervention (unless the

assessment suggests a clinical solution is the most appropriate) provides an opportunity to educate the individual in a manner more conducive to the intent of the Bone and Joint Decade and the evidence that has emerged since this time.

5.4.2. Increased incidence

All organisations witnessed an increase towards the end of this Decade, circa 20%, and three of the organisations introduced processes, which although limited, due to the restrictions mentioned above, delivered financial reduction without restricting care to the individual claimants (Table 18). Whether awareness of the multifactorial issues that can influence musculoskeletal health and ill health, improved during this time was not measured.

5.4.3. Change of provision

Company D changed their approach further in August 2016 whereby the IHMP provided the case management for all claims, irrespective of condition, and the insurance company utilised provided the contract management for diagnostics and in-patient stays. This meant that although restricted by the rules, the interrelationships between the underlying causation and the presentation of an illness were considered.

The case managers found that they often endeavour to change a belief that many illnesses could be *treated* via guided self-help rather than clinical interventions. The obstacle to this approach is the belief by individuals' that they need prompt clinical private treatment and that such treatment will resolve their problem in ignorance that it may not. To change such beliefs will take time, as encouragement towards self-help may be perceived as a cost saving measure. Educating members will require strong communication of the issues combined with supportive benefits and rules that aid awareness of why an individual should engage in regular activity, appropriate exercise, maintain an ideal weight and ensure good nutrition if their skeletal muscle system is to remain healthy in the longer term. Following receipt of the findings from their data Company D and Company B have decided that they will make considerable changes and actively promote non-clinical treatment options from the next renewal in 2018.

Table 18: Comparison of Healthcare plan incidence and cost across comparable periods

Healthcare Plan	Company A Oct 10 – 2013	Company B Oct 11 – July17	Company C Oct 11 – June 17	Company D June 11 to July 17
Membership (lives AVG)	2509	1024	5427	6798
Total number of MSK cases	901	1201	4757	5172*
Average number of cases per annum	300	200	792	862
Percentage of overall cases (claimants)	Unknown	25%	46%	68%
Total cost of MSD cases	£949,296	£1,102,464	£4,186,316	£6,440,205*
Percentage of overall cost		30%	30%	38%
Average cost per managed MSD claimant	£1053	£918	£880	£1,245*
Industry average	£1500	£1400	£1400	£1400
Musculoskeletal Body Area	51% missing			
Lower back (with and without sciatica)	23%	27%	26%	26%
Neck/shoulders/upper back	20%	22%	25%	22%
Hip/Upper leg	6%	6%	5%	7%
Knee/Ankle/Foot	24%	31%	29%	32%
Wrist/hand/elbow	7%	7%	8%	7%
Trauma, Multiple and other	20%	8%	7%	6%
Covariates of which in relation to weight	94% missing	28% missing	27% missing	28% missing
Excess weight/Obese	23%	34%	31%	37%
Inactive	66%	53%	56%	58%
Smokers	7%	6%	4%	3%
Exceed alcohol guidelines	9%	6%	11%	9%
Job Role of which	100% missing	25% missing	21% missing	42% missing
Active (involving shift work)	Unknown	2%	26%	3%
Sedentary (office)	Unknown	73%	53%	52%
Gender				
Male	61%	39%	49%	59%
Female	39%	61%	51%	41%

Table 18 continued: Comparison of Healthcare plan incidence and cost across comparable periods

Healthcare Plan	Company A Oct 10 – 2013	Company B Oct 11 – July17	Company C Oct 11 – June 17	Company D June 11 to July 17
Age Groups	Missing unknown	0% missing	1% missing	1% missing
<19	2%	4%	4%	3%
20-29	3%	6%	4%	4%
30-39	25%	31%	15%	24%
40-49	38%	32%	36%	38%
50-59	22%	21%	32%	24%
60-69	9%	5%	8%	5%
70 plus	1%	1%	0%	0%

*2.5 months of missing claims and cost and number of claimants appear to have reduced to 619 a 47% reduction

5.4.4. Observations from healthcare plan claims

MSD healthcare plan prevalence and incidence is far higher than sickness absence or management referrals. The traditional argument to support the provision of private healthcare claims was that by accessing prompt treatment (not available in the NHS) would help employees remain at work and reduce sickness absence, on the assumption that prompt intervention was beneficial. This belief is now challenged by some employers, as concerns are raised about excessive diagnostics and unnecessary and inappropriate treatment (Malhotra, et al., 2015) in the NHS and the private sector.

5.5. Wellbeing assessments

Quantification of results in a manner that is comparable is difficult due to the variations across providers. The historic data across three of the participating organisations found that musculoskeletal function or health, was not assessed in any depth. Only one provider undertook a musculoskeletal assessment (spinal posture) and, as accepted by the provider, limited in what the test identified. The IHMP introduced initially a basic overhead squat assessment with a view to understanding the extent to which musculoskeletal dysfunction could be identified. Following an incidence of over 90% within a trial population, this assessment has been further developed by the IHMP who have now trained physiologists of a major wellbeing provider to identify basic risks. Issues identified can then be referred to corrective exercise specialists for further consideration and management of employees of Company B and D.

5.5.1. Company A

Of 175 results that were considered but not fully reported on due to the limitations of this thesis the following were the most significant:

Table 19: Highlights wellbeing assessments

Risk	Factory	Field	Office
Nos. assessed	40	63	72
Reported MSK pain	8%	30%	30%
BMI >25kg/m ²	32%	20%	33%
Inactive	30%	40%	36%
Height to waist ratio	62%	Not measured	54%
High blood pressure	43%	59%	30%
Identifiable functional traits	93%	92%	90%

5.5.2. Company B

Employees that participated in the wellbeing assessments worked in the corporate offices. Of the 68 assessed: 45 were female of which 13 were aged < 30; 32 were 30-49 and 6 > 50. Of the 69% with an identifiable functional issue, 50% had a height to waist ratio above the recommended reference range.

Table 20: Highlights of assessment results

Risk	Combined
BMI >25 kg/m ²	41%
Inactive	37%
Height to waist ratio	42%
Identifiable functional traits	69%
Psychological risks (personal)	46%

5.5.3. Company D

Access to data were limited. During the period January to August (2015) only 34 individuals were assessed of which 31% were found to be at risk of developing musculoskeletal problems from a basic postural analysis. The provider did not report on activity or exercise but felt those at musculoskeletal risk were individuals that were either overweight or took very little activity and demonstrated insufficient muscular support for the back. Of the 34: 56% had a BMI greater than 25kg/m² whilst 46% also had a body composition or body fat percentage higher than ideal for their age.

5.6. Vehicle assessments

The provision of a vehicle assessment by the IHMP was instigated following a management referral when an individual presented to his/her manager with an apparent problem with the vehicle provided by the company for use on company business.

Such assessments were conducted on behalf of Company A and D who managed a fleet of both company vans and company cars. The main issue, which arose in both organisations, was from the provision of a standard company van, the VW Caddy Maxi. The size of this vehicle and the inclusion of a bulkhead behind the driver's seat, which restricts the degree of travel and recline on the seat, means that individuals over 6ft 2ins tall and/or with long leg length or long torso length for their height, may have problems with comfort and/or safety. If the vehicle is not suitable due to anthropometrics, excess weight or the presence

of a medical condition, a larger (or more appropriate) vehicle would then be authorised. Individual employees and or managers would sometimes request a new vehicle on the basis that they believed that the vehicle was either causing or contributing to their musculoskeletal problem.

The assessment process should assess the individual in their actual vehicle but the process employed previously by the provider of Company D was often in their vehicle of choice rather than to establish whether the allotted vehicle was deemed appropriate or not. The provision of a new vehicle based on want rather than need did set an expectation that a person's belief was sufficient. A more detailed assessment process introduced considered the personal risk factors and established what additional benefits could be achieved by the individual which would address any underlying issue irrespective of whether a new vehicle was or was not provided.

The following is a summary of the key findings.

5.6.1. Company A data

Following a process of evaluating 120 engineers a residual, thirteen remained with apparent ongoing musculoskeletal problems, which they perceived was caused by the VW Caddy Maxi, but which did not resolve immediately on leaving the vehicle. This vehicle is designed based on the average anthropometric data: femur 424mm; tibia 422mm; back 460mm and height of 1755mm. Dimensions of the vehicles were measured and compared to the exact measurements of the individual. Although adjustments to positioning of the seat would normally accommodate circa 95% of the population the addition of a bulkhead to the Caddy Maxi for both organisations, limits the degree of variation. The positioning of the pedals also means that for individuals with larger feet and the need to wear safety boots find a safe driving position difficult to achieve.

It was found that a limb length in excess of 500mm has the potential to compromise safety. All of these individuals exceeded the comfortable and safe limb length (femur and tibia). Other factors taken into account included: height, age, body length and BMI was the most significant factor that affected the driving position in these thirteen. The height range of this group was between 174cm and 186cm suggesting and above average height for most of these participants. The mean age was 44 years, suggesting that these problems were not age specific; seven had medical conditions and all had additional risk factors (e.g. excess weight or lack of conditioning) of these four had three risks; eight had four risks and one had five risks observed.

5.6.2. Company D

Access to historic quantitative data were held in a format within text fields and could not be easily extracted. Individuals who are not suitable for the VW Caddy Maxi have the option of a Vauxhall Vivaro or Ford Transit Custom. The culture had been to provide new vehicles in the hope that this would address the problem when the vehicle may not have been either the cause or contributory factor. Managers were concerned that if the individual claimed that the vehicle was causing an employee a musculoskeletal problem that a new vehicle would have to be supplied.

In the first six months of providing the vehicle assessments, the IHMP only received referrals for 74 van assessments from a fleet of circa 11,000 drivers. The use of anthropometric measurements helped managers automatically eliminate the VW Caddy Maxi for people with measurements outside of the norms that dramatically reduced the number of referrals. Use of this data on-employment also meant that the potential to cause an employee harm by the provision of a vehicle, which is inappropriate, could be avoided.

Other issues found included:

- Excess weight – a BMI of $> 30 \text{ kg/m}^2$ often meant an individual would not be able to drive the VW Caddy Maxi for any length of time;
- Muscle tightness – meant that some individuals may find the sustained posture uncomfortable during a working day;
- Psychosocial issues – they believe that the vehicle was the cause of their musculoskeletal problem (normally pain) or they simply wanted a larger and or perceived to be more prestigious vehicle (e.g. the Ford Transit Custom).

The introduction of a more robust assessment of people in the actual vehicle and the introduction of a personal risk assessment to address skeletal muscle imbalances and muscle tightness, and beliefs, saved Company D circa £200,000 (predicted £400,000 per annum) in unnecessary vehicle costs and potentially more from associated claims that previously could not be defended.

5.7. Results of musculoskeletal telephone triage (Company D)

One of the new ways of working introduced by Company D in August 2016 was to provide a musculoskeletal assessment service, which provided a clinical assessment of the individual

with the aim of ensuring that these employees were referred to the most appropriate clinician at the outset. Previously an employee and/or their manager were able to refer directly to a private physiotherapy practice. Analysis of the referrals identified that treatment was provided even when this was inappropriate and where the musculoskeletal condition would actually resolve without intervention. Table 21 is a summary of the data collected between January and March 2017 following the termination of the previous service in December 2016.

Table 21: Outcome of telephone triage

Outcome	Volume	Percent
Total cases	927	100%
Provided self-help	477	49%
Referred face to face	339	36%
Did not attend	111	15%

The number of cases referred for face-to-face (36%) compared to 86% with the previous physiotherapy network provider and 49% self-help compared to a previous 14%. Scrutiny of a random number of cases of the physiotherapy provider found cases where the sessions provided were unnecessary (the condition would self-resolve) and/or the number of sessions provided were above the standard guidelines for the MSD. It is believed, that this variance in practice explains much of the difference in the face-to-face referrals.

Of the 339 referred for face to face: 78% were to physiotherapy, with a suggested 30% reduction in number of sessions; 11% to a specialist; 6% a GP; 3% osteopath; 1% chiropractor and 1% accident and emergency.

The savings achieved in the first year are estimated at around £500,000.

5.8. Overall observations

The extent of the incidence and cost of MSDs within each organisation was previously unknown. Management disciplines within each company had operated independently and only viewed data relevant to their own areas of responsibility. Risk reduction strategies implemented in any of the businesses had been limited to health and safety controls such as manual handling training. Possible relationships between personal risk factors (e.g. excess weight and inactivity) had not been considered. Wellbeing programmes did not include any assessment or reference to musculoskeletal health with the exception of a

basic spinal posture analysis included in one type of health assessment and a basic functional movement screen introduced by the IHMP to identify possible incidence.

5.8.1. Overall incidence

The incidence of absence due to MSDs is significant and in all organisations accounted for the main reason for absence both in terms of number of cases and days lost. Low back pain also accounted from the main musculoskeletal reason for absence across all organisations but whether this was caused or made worse by work, was only captured by one organisation and further data considered within the qualitative data analysis chapter 6.

5.8.2. Excess weight and inactivity

The incidence of excess weight and inactivity was found to be significant across all organisations albeit reliant on subjective reporting and if objectively measured may be higher or lower for the reasons discussed.

5.8.3. Job role

Sickness absence by job role suggests that musculoskeletal incidence is higher in roles that are manual in nature or involve shift work. Company D data identifies field operations have an MSD prevalence of 10% compared to customer operations at 3%. Mental health conditions are almost juxta positioned. Other relevant factors are: all organisations reported that the office-based staff are not compliant in the recording of absence and the nature of manual, field or safety critical work mean that it is more difficult to return safely to such a role until a musculoskeletal condition has resolved.

Accurately assessing risk factors and the degree of activity in a role is complex in jobs that involve long durations during a working day of sitting (driving/flying) whilst also performing other tasks (e.g. manual handling) or involve other factors affecting fatigue (e.g. time zones) could not be quantified.

5.8.4. Incidence by gender and age

The incidence of males and females and by the various age groups were consistent to the numbers employed in each age group.

5.9. Summary

Analysis of the quantitative data raised more questions than could be answered by the descriptive data or any analysis of significance or strength of association but was sufficient

to guide the qualitative aspects of Study 1b (chapter 6) and in part Study 2 (chapter 7) and Study 3 (chapter 8).

The flaws found suggest that the information presented in grey literature, including public health information, is potentially fundamentally weak for similar reasons, as these constructs are not discussed. Employers and the private healthcare industry are working with data that provides only a fraction of the information pertinent to the assessment and management of the MSD. Employee benefits are designed to support the employee at a time of ill health or indeed to reduce the risk of ill health, but it would appear that current safety, health and wellbeing strategies are not delivering what is expected or required of them and may underpin why employers are starting to question whether practice needs to change.

5.9.1. Observation of overall incidence and cost

Although incidence of MSDs was high in all of the main healthcare benefits provided, incidence within the Healthcare plans ranked number one in terms of both incidence and cost across all four organisations. The rate of incidence at circa 50% of all claims is considerable and raises the question of whether the provision of private healthcare is actually a benefit to employees and their families because it provides access to prompt clinical interventions or whether it encourages individuals to seek treatment when a condition may resolve or may benefit from a non-clinical intervention. Conjoined with this question is whether practitioners are guilty of providing unnecessary diagnostics and treatment as suggested by the Royal Academy of Medical Royal Colleges (Malhotra, et al., 2015) or whether practitioners feel obliged to give people what they want rather than what they need in fear of some form of retribution.

5.9.2. Action research - early outcomes of a new approach

Following the presentation to the senior management of their data, accessed and analysed for this thesis, Company D decided to implement a new strategic approach (August 2016) to the management of health and ill health. This information, by combining quantitative and qualitative data, has identified occupational and personal risks that were inherent within their population but unknown to managers and employees. This is now driving a very different delivery model across their global operations and incorporated into the provision of safety, health and wellbeing benefits.

5.10. Conclusion

Analysis of the data has allowed considerable insight to both incidence and complexity and has led to the broadening of Study 1 to encompass a qualitative analysis of supporting documents (Study 1b) to aid understanding of why the incidence is so high. This data has also helped inform Study 2 and Study 3 to help identify what symptomatic individuals understand about the range of possible factors that could influence either the incidence or severity of their musculoskeletal disorder and what practitioners know or address when treating such individuals.

Chapter 6

Study 1b

Findings from Analysis of Documents

6. Introduction

The quantitative data outlined in chapter 5 (Study 1a) identified the incidence and cost of MSDs over a number of years in the four participating organisations across the different constructs. This chapter aims to enrich from case summaries the understanding of why employees experience musculoskeletal problems and whether these relate to work, personal factors or a combination. In addition, the chapter explores whether clinicians most appropriately assess and address possible confounding factors such as psychosocial risks, excess weight, inactivity, and strength and conditioning.

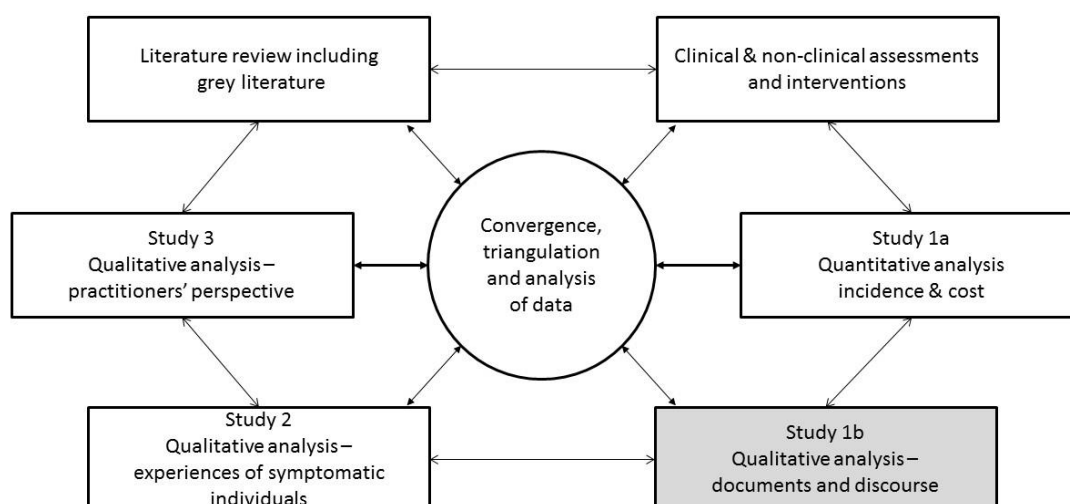


Figure 7: Explanatory sequential mixed methods research design – Phase 4

6.1. Case studies

A synopsis of the data on twenty-one individual cases, aims to provide an outline of both the simplicity and complexity that can arise with validation where provided or made available.

6.1.1. Commercial pilot

A 50-year-old male, who had been absent from work for several years.

He presented with low back pain with sudden, sharp spasms in the back which he managed by anti-spasmodic drugs.

His history suggested he had suffered less severe episodes some twenty-five years earlier but this insidious onset followed a declination of a request to relocate.

He described the impact of his condition on his life as:

- *I cannot sit for longer than 15 minutes then I need to lie down*
- *My pain prevents me from undertaking many activities and my sleep is sometimes disturbed by pain*
- *I could not contemplate a return to work unless there was a job which, allowed me to lie down at regular intervals*
- *The surgeon has told me that he cannot operate and that there is nothing, he can do for me*

Diagnostic and treatment considerations had involved regular anti-spasmodic medication; use of a TENS machine; several MRI scans; physiotherapy; three orthopaedic surgeon consultations and two functional rehabilitation programmes (FRPs). He had received conflicting information from clinicians: two had stated that surgery was not likely to be beneficial and recommended conservative treatment another had suggested that surgery might be a solution.

An independent assessment was recommended to evaluate how, for the benefit of the individual and the various stakeholders involved, he should be managed.

6.1.1.1. Summary of the findings from a multidisciplinary assessment

The Consultant Orthopaedic Surgeon and Consultant Orthopaedic Physician found that:

He sat throughout the meeting (90 minutes) without overt signs of distress or changing position. Essential spinal and relevant neurological and vascular examination was unremarkable. There were no features of any degenerative disease in the hips or other peripheral joints. There was no sign of any inflammatory arthropathy. Certain movements were guarded with excessive muscle tension. He dressed and undressed with demonstrable difficulty and his wife helped in this process.

Their opinion was:

A comprehensive multidisciplinary rehabilitation programme is the most appropriate treatment to help improve functional capacity. He has health beliefs that act to perpetuate pain and pain related disability and he sets unrealistic conditions as requirements necessary to support a

return to work. These factors, we believe, are the most significant obstacles to occupational rehabilitation.

If he were to remain in receipt of disability financial benefit in the absence of any specialist rehabilitation services, it is reasonably foreseeable that his functional status for employment will remain much the same. He has no physical impairment that would prohibit him from piloting a commercial aircraft again.

The IHMP identified an appropriate programme, which he reluctantly agreed to attend.

6.1.1.2. Findings from the functional rehabilitation assessment:

Pain was expressed through his behaviour and vocally throughout the assessment.

He presented with:

Flexed posture from his hips, unable to extend and mobilise with an erect spine struggled to stand with an upright posture throughout the assessment. He mobilised with an antalgic gait pattern with reduced weight-bearing on the left and reduced stride lengths.

A scoliosis was present at the lower thoracic spine, concave to the left. This turned out to be a pseudoscoliosis on further assessment supported by the associated muscle imbalance and altered muscle tone. Reduced active lumbar movements were noted due to pain and overt pain behaviour.

Active flexion was to both tibial tuberosities and minimal lumbar movement occurred during the assessment. Movement occurred at the hips but was limited due to pain and stiffness bilaterally.

Reduced thoracic range of movement was noted with pain and stiffness. Full active range of movement was noted at both shoulder girdles, however, some apprehension and tightness was noted towards end of range into full elevation bilaterally.

The physical assessment identified inconsistencies suggesting that his physical presentation was feigned to some degree, consciously or sub-consciously.

6.1.1.3. Psychosocial factors

A report and subsequent discussion with a psychologist involved in the FRP provided previously unknown information on this man including the death of a parent when he was a young age resulting in him spending the next few years in care. This trauma had never surfaced over the years and the possibility or otherwise of any suppressed emotions, subsequent depression, association with pain or impact on his personality is a facet of his illness that would potentially benefit from further exploration. The report also stated:

A significant level of pain-related disability and it appears that his on-going pain and associated symptoms are causing him a moderate level of psychological distress. He appears to have always presented distress from the outset but as highlighted the reason for this distress is multifactorial and he continues to display overt pain and fear avoidant behaviour; belief that pain means harm and that any form of exercise will cause more harm. Some evidence to suggest that he has a moderate amount of fear about performing physical activities. He has tended to remain housebound. He tries to make an effort to do light activities around the house but he struggles with domestic tasks requiring bending or lifting.

These findings were based on the physical and psychological presentation during the programme but without the knowledge of other factors where this individual had been able to perform physical tasks that he had related to the clinicians he could not undertake.

Clinical opinion from Consultants who specialise in this area suggest that this is associated with his *beliefs* as outlined above rather than directly associated with any clinical reasoning and which is validated by the conflicting information.

What is difficult to ascertain is whether he actually suffered any psychological distress specifically related to his musculoskeletal condition or whether his psychological distress stemmed from the tragic event at a young age, which may have led to the manifestation of his physical condition.

6.1.1.4. Work related issues:

These included:

Perceived Injustice – some eight years after the initial refusal by his manager to allow him to move location he continues to report ongoing anger with the manner in which his line manager dealt with his request.

Avoidance behaviour - is evident in relation to the required periodic health assessments to maintain his payment of 75% of his previous salary, plus inflationary increases. The presentation to his GP in an emergency, suggesting that his condition had rapidly deteriorated and required an emergency MRI scan followed by a presentation to A&E due to an apparent suicide attempt led to the cancellation of two planned assessments. This suggested that at the time of any assessment for validation of his ongoing financial benefits that he may develop acute flare ups of his condition.

6.1.1.5. Conflicting information

He has consistently reporting the inability to walk far and to be able to sit for more than 10-15 minutes. He voiced on a number of occasions that he could not travel far and certainly not for more than one hour but:

he travelled on a long haul flight of around eight hours, for a two-week holiday at a theme park, within days of making the statement.

He stated that he was becoming virtually housebound but:

was observed on more than one occasions taking his children to school.

His stated that his condition was deteriorating rapidly and presented for an emergency MRI scan outlining to his GP symptoms suggestive of a serious pathology but:

the MRI scan confirmed that very little had changed.

His reported symptoms which suggested significant pain and dysfunction yet

no clinical evidence was found to explain causation.

He claimed to have attempted suicide due to the distress caused by his employer in requiring him to undergo an assessment for the ongoing payment of his group income protection benefit but

no evidence could be found to support this.

6.1.1.6. Summary of the case

This individual had presented with LBP for many years due to a number of confounding factors:

1. A grievance (perceived injustice) against his manager associated with a request to change location;
2. Allusion to underperformance;
3. Motivation to maintain sick role due to attention received with the possibility that this was subconsciously associated with the tragic loss of a parent and the care a parent provides as highlighted by Prince Harry who disclosed such problems in the media, (Telegraph, April 2017) when he said that he “*shut down all of this emotions*” for twenty years following the death of his mother;
4. Avoidance of movement due to a belief that this may do him further harm;

5. Ongoing payment of group income protection and length of absence reduces motivation to return to work;
6. Lack of active engagement in rehabilitation to improve physical and psychological state and rate of degeneration;
7. Conflicting clinical messages have enforced the belief of a more serious pathology.

Unfortunately, the clinical focus has remained on his back pain whilst his psychosocial factors have not been addressed. Ongoing avoidance behaviour is likely to lead to deterioration of his skeletal muscle system, restrictions in his mobility and quality of life and lead to further physical deterioration with attributable physical causation. This individual would benefit from exercise and the appropriate psychological support but this is only possible if he wishes to engage which is unlikely whilst he fears that he may need to return to work.

6.1.2. Commercial pilot

A 58-year-old active male (BMI 27kg/m²) had been absent for nine months with: right > left medial compartment knee Osteoarthritis; bilateral medial facet patella-femoral Osteoarthritis; bilateral recurrent Baker's Cyst.

His history suggested recurrent sharp pain infra-patella and medial knee during and after sporting activities dating back to his twenties and episodes of giving way in left knee resulting in falls, insidious onset constant anterior-medial joint line pain on the right knee, restricting standing duration to 10 minutes.

6.1.2.1. Previous treatment

Arthroscopic surgery in 2007 on left knee and on right knee in 2010.

Since which he has experienced infrequent episodes of severe right medial joint line knee pain, resulting in significantly reduced mobility for 1-4 days; the patient reports these episodes occur every 1-3 months and are variable in severity and longevity.

He believed that:

I have been told, that I will not be able to fly again

I need to accept this and my goal for improved functional ability is to be able to sail on consecutive days

Diagnosis at functional rehabilitation assessment found:

Right-side anterior-medial joint line knee achiness rated at a variable 5/10 on the Visual Analogue Scale score (VAS). Can increase to 7/10 after 1 km walking or 4 hours sailing. Occasional right-side inferior facet of patella femoral joint rated at 7-8/10 VAS occurs following patella 'click' usually at 45-degree flexion. Right-side Popliteal fossa pain due to Bakers Cyst rated at 8/10 VAS after prolonged activity.

Left knee anterior-medial aspect gentle ache and occasional burning sensation after activity.

Significant muscle bracing globally, especially around lower back, pelvis, hips and hamstrings. Range of movement within normal limits and fully meets requirement for full walking functionality.

Reduced proprioception through gait resulting in reduced quadriceps control around the knee during swing phase, heavy-landing heel strike and a varus thrust of the right knee during stance phase.

Reduced proximal stability on functional activities, possibly due to global muscle bracing. Increased laxity of right anterior cruciate ligament on anterior drawer test.

6.1.2.2. Psychosocial factors

Psychosocially this individual appeared to have a positive outlook on life and had regularly engaged in sporting activities including sailing, walking and some swimming and cycling. He had been led to believe (he felt) that he would not be able to return to his previous level of functionality and that this would prevent him returning to work.

This belief was challenged, in the hope that this would allow him to move to a position where he was ready to change. Once accepting this possibility, he actively engaged in his rehabilitation programme, which consisted mostly of different forms of strength and conditioning training.

Although the ongoing payment of benefit and a lump sum payment on loss of licence could have been an obstacle to recovery, in this particular case the individual was motivated to return to flying and to be able to continue with his sporting activities.

6.1.2.3. Outcome and summary of the case

This man achieved both subjective and objective improvements within six months of an exercise-based intervention and he continued to improve sufficient to return to work as an airline pilot within eighteen months.

He reported a reduction in his pain with a significant reduction in the frequency of acute pain and on the occasions that it has occurred, it has been relieved within 2-3 minutes. This enabled him not only to return to work but also to regain his quality of life outside of

work whilst also saving the insurance company and his employer circa seven years of income protection benefits (approximately £500,000) and another insurer a loss of licence insurance payment of circa £100,000 for a cost of the treatment provided of around £6,000.

6.1.3. Commercial pilot

A male, aged 38, presented with low back pain, left leg pain, and wished to claim on his healthcare plan, provided by his employer. He reported pain most days, with pain in left buttock radiating to posterior thigh and especially with sitting, including on the toilet and putting on his shoes. The requested treatment was not evidence based and resulted in his claim being declined.

He had a BMI of 30 kg/m² and reported enjoying going to the gym and playing golf.

6.1.3.1. Medical history

He had first experienced back pain at age 31 and then fractured his right tibia at age 35. He had received five chiropractic treatments in 2010 for back pain. He also tore his left hamstring and had eight physiotherapy sessions in 2012 prior to the onset of his back pain. In relation to his low back pain, he had undergone an MRI scan, which highlighted modest discovertebral degeneration at the lower two lumbar levels and minor postural disc bulges at L4/5 and L5/S1 confined to anterior extra dural space and no extrinsic neural compression was apparent. Prominent annular fissure was noted L4/5 and the diagnosis given was minor lower lumbar discovertebral degeneration (consistent with age) and not necessarily the cause of his pain.

The clinician summarised by saying:

Otherwise a healthy looking man who walks with a normal gait and upright posture. Able to walk on heels and tip toes. He demonstrated a good range of movement of the lumbar spine and a full straight leg raise of 90 degrees with no root tension signs. He had normal pinprick sensations and power to muscle groups. Reflexes were normal and there was no specific spinal tenderness.

Advised to practice core stability exercises.

6.1.3.2. Psychosocial issues

Several notable factors arose from the assessment of this individual including:

A possible form of perceived injustice when he returned to work after being non-weight bearing on crutches for some time, following his hamstring injury.

When I returned to work, I had to work in the flight simulator and it was during this work that I bent down and twisted which resulted in immediate back pain.

The reported change in day-to-day life following the birth of his son, nine months earlier.

He was not absent but threatened to do so if his treatment was not funded by the healthcare plan (HCP). As a union representative, he threatened to tell his colleagues that the HCP was not fit for purpose and that the administrator was not considering the best interests of the individuals.

This individual believed he had a serious condition that required a specific form of surgery, namely Discography and Intradiscal Electrothermal Therapy (IDET) which was deemed at the time by NICE (2015) to be in an experimental phase. The alternative procedure was the more invasive but, at the time, evidence based, surgical stabilisation procedure (Fairbank, et al., 2005). He was provided with information outlining the risks of this procedure and that all conservative options should be explored. It was evident that he had not engaged (nor would he engage) in the conservative options and was reluctant to consider any other form of treatment. His belief was that this procedure would help and following his threats, his employer decided to pay for the procedure, even though excluded from the HCP. The initial indication was positive and the individual started a weight loss programme and an exercise regime at the gym. After a few months, his pain returned to that of before the procedure.

6.1.3.3. Summary of the case

The clinical indications suggested minor problems consistent with age and someone who did not have an active lifestyle and was overweight. Although he suggested that the enjoyed the gym and golf there was little evidence to support any level of fitness that would help him manage his back pain. His belief was that his condition was actually more serious than it actually was. It was not clear whether he had drawn this conclusion from language used by a clinician or whether this had arisen from some other suppressed emotions.

He presented as an individual who had issues with his employer in terms of the requirement to work in a flight simulator on his return to work following a hamstring injury, as per normal safety protocols, but for some reason, he found difficult to accept. He attributed the onset of this episode of back pain and the ongoing problems to an incident in the simulator. As a senior union representative, he had disputes with his employer

about pay and benefits, including the level of benefit provided by the HCP. He did not express any verbal dissatisfaction with his role as a pilot, but it is possible that subconsciously he may have been affected by factors such as leaving his son and wife and or experienced less tolerance to the change in time zones, working in a confined space and eating hotel food therefore preferring his office based role as a union representative. The availability of an income protection benefit and a lump sum payment (black flag) would also mean that he would not have to worry financially if he ultimately chose not to fly in the future, all of which could be subconscious or conscious thoughts.

6.1.4. Commercial pilot

A 48-year-old male pilot, presented initially with bothersome backache.

He had experienced low back pain in his teenage years and eventually he had to cease competitive cycle road racing at the age of twenty-five. He had facet joint injections and then had very few problems other than that which could be alleviated by chiropractic or physiotherapy sessions.

6.1.4.1. Recent medical history

He found some reoccurrence with significant trunk tilt and problems with walking in 2009 but symptoms settled with facet joint injections and physiotherapy. After which a few intermittent episodes and little time off work. In 2012, he felt that the frequency increased with bilateral buttock pains and was advised to engage in core stability exercises. From this time, he continued to be assessed and provided with treatment including: March 2013, MRI scan found no serious pathology and injections provided; October 2013, facet joint injections and facet joint rhizolysis; November 2013 medial branch/facet nerve blocks; January 2014 right and left caudal injections.

The consultant was astounded that he continued to have an initial positive reaction to the treatment but followed by a worsening of his symptoms. Pain rated as three or four out of ten and claimed he had no benefit from NSAID's. Pain aggravated by extension and sitting tolerance had reduced to one hour; walking limited to 20-30 minutes after which he experienced pain in the legs together with pins and needles in the whole of his foot as well as occasional numbness occurring three times in last eight weeks. The consultant arranged an MRI scan, which found a L4/5 disc bulge with some modest lateral recess narrowing at that level; significant annular tear at L5/S1 and significant deconditioning of the lower erector spinae muscles. A discussion took place on whether the L4/5 or L5/S1 disc are the

source of his issue and the recommendation made to undertake further core stability exercises.

At this stage the person described in the case study outlined above advised this gentleman that the IDET procedure had worked for him. As he was under the same consultant discussions took place about this procedure. The result was that the consultant recommended the discography following by the IDET procedure. This man was a member of the same HCP but the Trustees decided to refuse the treatment following receipt of further evidence. The individual reluctantly decided to fund the procedure himself and this took place in September 2014. A similar scenario arose in that he had initial benefit but soon returned to his normal level of pain.

Nine months later in July 2015, he had novel left sciatica with positive nerve root signs and a diagnosis of probable lumbar disc prolapse with nerve root compression. The consultant requested an MRI scan and reported that:

In general, the reports concur that he looks well and walks with a normal gait and upright posture. The range of movement included forward flexion with fingertips to mid-tibia. Negligible amount of extension and only 50 percent of lateral flexion and when combined reproduces typical pain. Straight leg raise was 60 degrees limited tight hamstrings but no nerve root tension. No neurological deficit was found. When standing some flattening of the normal lumbar lordosis, there is no specific posterior spinal tenderness.

He may have some facet joint problems occasioned by his undoubted lumbar spine degeneration. As a result of this he has relative segmental instability, which may trigger these flare ups of pain. This in turn creates extra stress on the facet joints, which bear more load, and the facet joint may then develop secondary degeneration. The combined effect of this is to produce stiffness in the spine which if prolonged may produce some contraction of the facet joint capsule and otherwise normal movements provoke more pain, further reduction in range of movement etc.

One way of breaking out of this "pain cycle" would be to perform some facet joint injections. If this provides him with a measure of pain relief, he could then hopefully work hard at his core stability and the range of movement to improve his functional capacity.

The concern is that this treatment, over the last twenty-five years, has only provided short-term benefit yet it is being recommended for his current episode in the knowledge that it is unlikely to provide a successful outcome.

6.1.4.2. Non-clinical assessment

A non-clinical assessment of this individual by an exercise professional found that although this man was tall and slim and a regular long distance road cyclist he had a number of skeletal muscle problems. This included:

1. Poor posture (including forward head), exacerbated by many years of road cycling with little contra exercise to counteract the particular stressors of this type of sport combined with working in a confined space (cockpit);
2. Deconditioning of trunk and core further suggesting lack of appropriate exercise to support posture and combat sport and work physical stressors;
3. Lack of flexibility.

Initially the individual claimed to understand the issues and stated that this is the first time that corrective exercise had been suggested as a possible resolution. However, after a short period he returned to seeking a clinical solution.

6.1.4.3. Psychosocial factors

From a psychosocial perspective the connection between his low back pain and the belief that this was why he had to retire from competitive sport. Whether he was or could have been successful at cycling is unknown but his condition deteriorated in 2012 the year that Bradley Wiggins became the first British cyclist to win the Tour de France. A significant event for any cyclist and possibly poignant to a former competitive cyclist, who believed his cycling career, was halted by his back pain.

The continuing surprise by clinicians that any treatment benefit is only short lived indicates that the psychosocial factors are significant and may justify his belief that his back pain was what stopped him from cycling and that now it would stop him from flying. Yet he had been contemplating a possible change in role, for reasons that appear to be associated with a better work life balance and the wish to spend more time cycling which seems to foster a lack of desire to return to flying. It is possible that in his mind, such a change of lifestyle, could at his age and as an amateur cyclist, provide him with accolades associated with the recognition of doing something well and support his human need of being appreciated for this.

A further contributory factor may be that associated with a financial gain ongoing income at 75% of salary until age 65 and a lump payment for loss of licence.

6.1.4.4. Summary of case

The non-clinical assessment revealed that although this individual was fit for cycling he had postural problems and muscle imbalances. He also had significant tightness and inflexibility. The consultant believed in conservative treatments and continued to recommend core stability exercises but with little recognition, that such exercises are not effective if prescribed at a point of acute pain and it not performed using the correct technique (form and graded number of repetitions) and that other exercises were required.

Psychosocial issues were present but not explored by any clinician and it is difficult to establish from the reports whether any particular issue was causing or contributing to his pain and the fact that no physical treatment had worked. It is possible that the potential “elephant in the room” has not been found and that without identification of the problem his condition will continue. His belief that his back pain caused him to stop cycling when the real reason may have been somewhat different has emerged again as his justification to stop flying when another possibility may exist.

He has now ceased to be a pilot and continues on group income protection but no further information is available.

6.1.5. Technical engineer

A 45-year-old male, presented with back pain, which was affecting his ability to work. He was 6 feet tall and 220 pounds with a BMI of 31kg/m² and a blood pressure of 130/92 suggesting that this individual had some serious health risk factors. He stated that he did not undertake any exercise.

6.1.5.1. Clinical presentation

He believed he has a serious illness that prevents him from undertaking his normal role. This belief appears to have arisen from language used by a consultant in relation to the findings from his MRI scan. The use of the term degenerative disc disease had contributed to his belief that his condition had deteriorated since previous scans. He also noted an increase in his symptoms in July 2016 when his daughter was taken ill.

6.1.5.2. Work issues – medical redeployment request

Physically he was declared fit for his normal duties as no underlying pathology had been identified from his MRI scan, but he wanted to be transferred to a different role in the belief that this would involve less manual handling - his perception rather than reality.

He had received ten sessions of physiotherapy, had attended a ten-week pain management programme and reported taking morphine and Tramadol.

More evidence relating to fitness to work in his normal duties, modified or alternative duties was required.

6.1.5.3. Findings from a functional capacity assessment (FCA)

This type of assessment aims to objectively measure function, strength and flexibility. The problem facing the assessor on this occasion was that this individual did not actively engage in the assessment process and did not demonstrate adequate function to carry out the physical demands of either his current role *or* the role he wished to be transferred to. The individual was unaware of the consequences of his failure to comply and that inconsistencies in the test results suggested that he was not using maximal effort as required. This could have been due to his belief that activity could cause him further harm or it could be that he felt that this would then provide the evidence to allow him to move roles.

Findings from the FCA included:

Pain rating scale between four and five out of ten. Sway back posture with markedly restricted ranges of active lumbar movement. Passive movement was met with a degree of muscle guarding in relation to the assessment of both hips and sacroiliac joints. Palpation of the lower lumbar spine in supine was also associated with a large degree of pain behaviour not always associated with direct postero-anterior pressure and often before the onset on any noted resistance to movement.

There was also a discrepancy between a full asymptomatic slump test and markedly restricted and provocative bilateral straight leg raise, which is difficult to account for from a purely physical perspective. Lack of consistency when performing tests for objective measurement suggesting that he was withholding effort.

6.1.5.4. Psychosocial factors

Psychosocially he scored 65 out of 200 on the EPIC Norfolk physical activity questionnaire suggesting that he is unable to carry out activities of a sedentary physical role. Use of subjective assessment tools, allow intentional misrepresentation of reality or in this case could have been affected by feelings of perceived injustice by his employer. He has stated that he believes that the awkward postures in the role have contributed to his back pain and he responded badly to their refusal to move him to a lighter role, which is a known psychological stressor. He did however; report a good relationship with his manager.

6.1.5.5. Summary of the case

The main issues are:

1. His belief that his condition is more serious, possibly due to the language used;
2. That his job has caused the problem;
3. That the role he requested has been declined and that this involves less manual handling when this is not correct;
4. That his condition appears to have deteriorated from the time his daughter was taken ill;
5. He has no understanding that his lack of fitness and excess weight could have contributed to his problem.

This case typifies the qualification of “work-related” as this was the individual’s opinion but no evidence to suggest that this is the case exists. It is apparent that there are a number of psychosocial aspects present but the clinical focus has been on the physical symptoms for which there is little more that *can be done*, as surgery is neither needed nor appropriate. The pain management programme focused on clinical interventions such as medication and injections and paid little attention to the possible real causative and contributory risk factors.

6.1.6. Technical engineer

Male aged 38 presented with low back pain, which he attributed to working in an inappropriate company vehicle, a Vauxhall Vivaro, for two weeks and which resulted in six months’ absence.

He was referred to the integrated health management organisation as the employee wished to return to work, which the manager believed was due to the employee’s pay being due to be reduced by fifty percent and his line manager did not wish to allow this until such time he had established fitness to work. The manager’s concern was not simply around the musculoskeletal disorder but another condition that had emerged during the employees’ absence, which the manager felt could be safety critical.

The initial assessment with the line manager and the employee identified a problem associated with perceived injustice but for reasons that were not directly linked to the employee. In his role of union representative, he had a dispute with the line manager, some three years earlier, about another employee who was subsequently dismissed. This

incident appeared to have affected the relationship between the manager and the employee since that time and the employee deemed the manager obstructive and no longer supportive, whilst the manager felt saddened that the individual had become more difficult to manage albeit that his work ethic was still excellent.

6.1.6.1. Clarification of medical history

The case manager identified a previous history of low back pain associated with a road traffic accident in 2011. The episode, which was apparently responsible for his ongoing absence, had resulted in the GP signing him off work, prescribing strong painkillers and a course of physiotherapy. Following little improvement, the physiotherapist referred him back to the GP for a specialist consultation and MRI scan. A *bulging disc* was identified on the scan, and was treated with an epidural injection, after which he reported a 75% improvement in his symptoms.

The individual also had a BMI of 36kg/m² with a blood pressure of 153/81 and stated that, he attended a gym regularly including lifting weights.

6.1.6.2. Functional capacity assessment (FCA)

The main findings from the FCA were:

Low tone abdominal muscles were observed. Spinal curves were symmetrical and within normal range. Normal ranges of motion were demonstrated at the lumbar spine and lower limbs. There were no dermatomal, myotomal or reflex changes of note. The findings did not indicate any serious spinal pathology such as nerve root or cord compression and suggested recovering mechanical low back pain with minimal pain. Lifting ability demonstrated capabilities of borderline for some of the heavier more awkward lifting aspects of his role and was consistent with someone having not worked for several months and recovering from back pain.

The psychosocial factors reported included: belief that the van had caused a bulging disc which had led to his back pain; ongoing claim against his employer; no perception that his weight or physical fitness had any impact on his back pain; and ongoing friction with his manager.

6.1.6.3. Review of vehicle assessment

The vehicle assessment that had been undertaken by an external provider following the original complaint by this individual about his van, was not, in the opinion of the IHMP, robust. A statement from the physiotherapist who conducted the assessment stated:

“I cannot definitively tell you why the Vauxhall Vivaro 2015 didn’t fit. The client’s presenting complaint was exacerbated by daily driving of the Vauxhall Vivaro, so the requirement was to find an alternative unlikely to exacerbate his musculoskeletal condition”

The physiotherapist did not appear to take into account: this man’s previous episodes of low back pain; his road traffic accident; his obesity; his strength and conditioning and the psychosocial factors. Instead, he appeared to reinforce this individual’s belief that the van had caused the problem and suggested a Ford Transit Custom van, which has similar interior dimensions to the Vauxhall Vivaro.

6.1.6.4. Summary of the case

The individual’s main issue appears to have arisen from a form of perceived injustice associated with the handling of another employee some years earlier. Although the IHMP made recommendations to both parties suggesting they discuss their issues or undergo a form of mediation this was not accepted.

His belief was that his manager was not being supportive when the manager believed he was trying to help him but also had to follow health and safety policy around fitness to drive and work safely.

The individual had no perception that his previous history of low back pain was significant and that his excess weight and lack of conditioning could all contribute to his ongoing problems. Although he reported the performance of certain exercises, this was not apparent from his assessment. Incorrect technique or excess load when using weights could also contribute.

6.1.7. Technical engineer

A 35-year-old male requested a new larger automatic van due to bilateral hip problems. This request had been supported by suggestions from both his GP and physiotherapist who concurred that an automatic larger vehicle was required. What was not evident from the clinic letters was whether these statements were clinical opinions or a preference of the individual.

6.1.7.1. Review of the evidence

The provision of an automatic larger vehicle within the organisation’s fleet was not easy to access. It was therefore important that they had clarification of exactly what type of vehicle would suit this individual. Although the IHMP were advised that this individual had

bilateral hip problems, a review of the clinical reports including an MRI scan suggested a very mild impingement in the right hip and no issues with the left hip.

This was consistent with the opinion of the senior physiotherapist from Guy's and St.

Thomas NHS Foundation:

Mild features of pincer type femoroacetabular impingement. No other abnormality is seen. No targets suitable for injection are demonstrated.

But contrary to the fit note, outlined below, from the GP:

Suffers from this debilitating condition that may require surgery, in order to avoid this, he would benefit from not driving a low manual vehicle. Recommend higher seated position, adequate seating and steering adjustment and automatic transmission.

Any information which may justify a larger vehicle e.g. height and or limb and torso length, was lacking and there appeared to be no evidence to suggest that an automatic transmission would be of any benefit.

6.1.7.2. Psychosocial factors

The GP fit note and conversations with this man may have led to him believing that he had a more serious condition. Use of language such as *debilitating condition that may require surgery* is potentially damaging to a person of any age but for a younger person this may be interpreted in a manner which could cause long term damage beliefs.

Alternatively, it is possible that an automatic transmission is the preferred option as such vehicles are easier to drive around town and that this man steered his GP to this recommendation but this can only be hypothesised in this case. To avoid ongoing problems, it is important that the minor impingement is de-medicalised and put into context in relation to its severity.

6.1.7.3. Summary of the case

This individual has a minor problem that can easily be resolved but damage beliefs may, become future maintenance factors.

6.1.8. Technical engineer

A 32-year-old male had been absent for five months with low back pain. His GP had referred him for an MRI scan but there were no clinical indications why he should be referred. An assessment of the individual by a physiotherapist suggested that the reason for his ongoing low back pain was due to muscle tightness and joint stiffness and that he

undertakes on average very little exercise other than the activity inherent within his work tasks.

6.1.8.1. Psychosocial factors

During his episode of back pain, he had adopted avoidance behaviours leading to increased tension and sensitivity to pain symptoms. He initially believed that any movement would cause him further harm reinforcing his avoidance behaviour. Over several months, the physiotherapist was able to coach him in graded activity, increase his confidence and provide him with techniques to reduce his symptoms.

6.1.8.2. Summary of the case

A very simple case of mechanical low back pain which appears to have arisen due to deconditioning and the associated muscle tightness and joint stiffness. Individuals, can often believe that this is due to the ageing process and not associated with reduced activity. His avoidance behaviours, common in symptomatic individuals, were addressed with coaching in self-help techniques, appropriate for the prevention and management of low back pain. Such advice had not been provided by his GP who was only familiar with the medical model and the associated referral pathways. It is hoped that this individual will benefit from understanding his pain and how to prevent and manage it, should he have future episodes.

6.1.9. Office based worker

A male, aged 53, was referred to the integrated health management organisation to review the ongoing payment of his benefit and to establish whether he could return to work.

6.1.9.1. Summary of independent assessment by orthopaedic surgeon and physician

Individual self-report suggests no significant back problems until a fall at work in 2006 when he slipped on a ramp due to ice. He fell backwards twisting as he fell and he was unable to break his fall. Although he experienced back pain immediately, he continued to work for two years until an acute exacerbation caused him to collapse. He understood he sustained damage to his vertebrae and has ongoing episodes, which can last for a few days and require him to stay in bed.

Clinical assessments by a spinal surgeon and a neurologist resulted in a variety of conservative treatments including: facet joint injections; attendance at a pain clinic and nerve root block injections. All of which failed to help.

6.1.9.2. Psychosocial context

Unable to work for a number of years and does not currently see himself returning to employment. He lives with his wife and daughter who has just started University.

He reported:

Walking restricted to 5 minutes at a time and unable to sit for 30 minutes to watch TV programme and sleep disturbed every night. Only has a small circle of friends on account of his functional restriction. His medico legal case relating to his fall had been concluded.

The ongoing payment of his Group Income Protection benefit is an obstacle to recovery as he has no financial motivation to return to any form of employment.

6.1.9.3. Perception and aims

This individual expressed very little desire to return to work due to his ongoing symptoms.

He believes that:

The problem as I understand is I have damaged five vertebra during the accident at work and this is causing ongoing problems with my nerves

6.1.9.4. Result of physical examination

Moved in chair frequently – consistent with his earlier comment of being unable to sit for any long period and was able to undress and dress independently.

Widespread tenderness of spine and marked pain reaction to light palpation. Movements markedly restricted although simulated rotation cause pain

Neurological examination was unremarkable and supine straight leg raise was not more than 40 degrees bilaterally although he achieved 90 degrees with distraction

Hip movement was full but produced back pain inconsistent with the examination

He scored 70% on the Oswestry Disability Index (ODI), suggesting a very high level of disability; 5/9 on STaRT Back and 13/28 on PHQ 9 indicating moderate depression.

6.1.9.5. Opinion

Non-specific low back pain with adverse psychological features that impair normal recovery.

He displays level of acceptance of his condition and takes no responsibility for moving forward and engaging in rehabilitation that

may improve his function. Including avoidance behaviour with regard to activity, although reporting relatively infrequent significant exacerbations.

These clinicians felt that, whilst he thought that surgery might be an option, in their opinion it was not appropriate and potentially could encourage his avoidance behaviour. Their recommendation was a multidisciplinary rehabilitation programme but accepted that neither he nor his wife appeared interested in any form of recovery.

6.1.9.6. Case summary

This individual does not have a significant physical impairment sufficient to maintain his absence from work but he has significant *damage beliefs* that appear to have arisen from the language used by the surgeon and medical staff and then overlaid with his interpretation of what this meant. His *attitudes and beliefs* are maintaining his condition whilst his *fear avoidance* of engaging in regular exercise will result in his condition deteriorating especially whilst he feels surgery may be an option.

Ongoing payment of income protection at 75% of his previous salary and which will be maintained until the age of 65 is a considerably obstacle to recovery whether sub-conscious or conscious thoughts. This individual demonstrated moderate levels of depression suggesting that his life was not fulfilled. As he ages, the lack of physical activity from such an early age is likely to increase the risk of further mobility problems decreasing the quality not only of his life but that of his wife and daughter. In addition, such cases also become significant burdens financially on the social care system.

6.1.10. Office based worker – not absent

A male aged, 43, presented with neck and upper back problems. He had previously also presented with lower back issues. His job involved a considerable amount of travel and he appeared to work under a considerable amount of stress with not only his main role but also his involvement in other ventures.

6.1.10.1. Summary of telephone physiotherapy assessment

Right lateral elbow tendinopathy with ligament involvement. Feels he has 60% function. Insidious onset lasting more than one month. Possibly relating to gym work. Can disturb sleep. Tried Voltarol with no improvement. Finds gripping objects or shaking hands aggravates the condition and has not found anything that eases it.

He stated that the effect on his activities of daily living are associated with lifting and weight training and work is not affected. No psychosocial factors identified stated BUT his barrier to recovery is that

he does not wish to rest from the gym. Clinical impression: overuse at gym.

Treatment plan: Ultrasound, exercise, soft tissue massage and altered weight programme.

6.1.10.2. Follow up assessment with physiotherapist (bio psychosocially trained)

This individual has a stressful occupation with intermittent history of lower and upper back symptoms. More recently woken with stiff neck. In the past had his problems managed by osteopathy or chiropractic.

Left side – neck pain and sharp pain first thing, aches throughout the rest of the day. Reports clicking sounds with some slight pain at same time. Does not report anything that eases his symptoms but not woken by pain.

Uses gym 3-4 times per week but not been going recently. Condition is not affecting his work.

The significant psychosocial factors in this case relate to his *attitudes* and *behaviours*. From his comments to the case manager he does not appear to wish to do any form of self-management, preferring passive treatment, possibly linked to his statement that he is very busy and has very little time and/or a belief that this will not be effective. He also reported to the case manager that he works in static positions which he feels impact on his posture. From the notes there was little suggestion that he understood that the pressure of work and associated stress could lead to tension in neck especially when combined with the working position he outlined.

Clinical impression was mechanical neck pain with facet joint irritation circa six-week weeks earlier. Advised face-to-face osteopathy.

6.1.10.3. Ongoing problem

This man was concerned that he had a more serious problem and wanted to be referred to a cervical spine surgeon via the HCP even though there were no clinical indications to suggest that this was necessary. As it was unlikely that this belief could be changed, an appointment with a consultant and an MRI scan arranged.

The MRI highlighted some early degenerative changes at C2/3 on the left side, which he felt was the reason for his pain but which the surgeon advised was normal wear and tear and recommended physical therapies and analgesics. The individual could not accept the surgeon's opinion believing there was a more serious underlying issue.

6.1.10.4. Case summary

This individual works in a role with significant psychological demands from which he takes few breaks from work. He works on a computer for long hours, with few breaks, which may cause a forward head posture and the resulting strain on his neck, upper and lower back. During discussion with a physiotherapist, he would not consider: any changes in posture or stretching exercise to alleviate strain and tension; acceptance that the ongoing stress of his job could cause tension and lead to neck pain; possible impact of lifting weights in the gym, and that either with poor technique or too heavy a weight, may be relevant. Although, it would be useful for this individual to be assessed by a corrective exercise practitioner to review his occupational and personal risks, and to provide exercise as a treatment, this individual is seeking a clinical answer and unable to understand the broader biopsychosocial causation.

6.1.11. Office based worker

A female, aged 35, presented with left sided hip pain plus injured shoulder whilst skiing.

6.1.11.1. Summary initial assessment

Previous hip pain following pregnancy, which has now returned, and the individual is wondering whether the problem is being exacerbated by running which she undertakes about three to four times per week. She reports that the pain starts in the hip and moves to her knee on left hand side. She had physiotherapy when pregnant which helped and she has had shiatsu massage.

6.1.11.2. Summary of telephone assessment by physiotherapist

Individual suggested onset of pain about 8-12 weeks ago and description of left hip pain more appeared more ilia that hip joint, from bra strap to hip joint. It is a persistent pain, which is described as a dull ache and possibly muscular. No apparent neurological involvement and no weakness, giving way or locking and no complications during pregnancy.

Aggravating factors: running gait, stretching leg after exercise or jogging.

Referral to physiotherapist for initial assessment on shoulder and hip

6.1.11.3. Psychosocial issues

The documents accessed identified a number of negative attitudes and beliefs accompanied by catastrophic thinking and fear avoidant behaviours (as described in chapter 3).

6.1.11.4. Case summary

This is a case where physical symptoms possibly link to a combination of events including: pregnancy, ski accident and running combined with psychosocial factors. What is not clear in this case is whether the possible relationship between the hip and the shoulder in relation to the anatomical sling system and how the muscles, tendons, ligaments and fascia can traverse the body connect are being considered. This may identify possible, muscle imbalances that have arisen during and following the pregnancy and or whether her running style or skeletal muscle foundations are contributing to her problem.

6.1.12. Office based worker

Female aged, 30-49 presented with neck and upper back problems with onset two weeks earlier, the day after a five-hour flight and no relief with ibuprofen and no previous history.

6.1.12.1. Summary of telephone assessment with physiotherapist

Muscular pain left trapezius and into shoulder. Tight no neurological signs. Aggravated on rotation to left, flexion, right rotation, side bending and left and right extension. Eases with stretching, self-massage and NSAIDS gel and tablets. Sleep affected and waking up with pain. Social activities and work not affected. No psychosocial flags identified

Attends strenuous keep fit classes three times a week and drinks one litre of water a day. Other underlying issues has bowel problems.

Clinical Impression: Facet lock with acute muscle spasm in neck

Treatment advice: Initial assessment and treatment with osteopath and arrange nutritional support as wants to manage bowel problems through diet

6.1.12.2. Telephone clinical assessment for second claim (5 months later)

For right ankle lateral ligament tear.

Whilst on holiday fell and twisted ankle. Immediate pain, swelling and difficulty walking. Took NSAIDS gels and tablets. Rested whilst away and easing now. Had X-ray but no more serious problems identified.

Current symptoms pain/swelling @ lateral malleolus & lateral dorsum of foot if walks too long but eases on rest. Functional restriction circa 45% of normal.

Sleeps well but ankle is stiff on weight bearing first thing in the morning. Cannot wear normal shoes with heels and needs to be more careful on stairs. Does not feel can exercise yet.

Clinical impression: anterior talo-fibular grade 2 tear and no barriers to recovery well motivated.

Follow up assessment: achieving full recovery and 95% of function returned so discharged.

6.1.12.3. Case summary

Both incidences were classified as standard cases by the IHMP.

The initial claim relating to the neck and shoulder related to normal everyday use of the musculoskeletal system and it is not apparent whether the onset was due to sleeping awkwardly on the flight.

The second was a Grade 2 ankle sprain, which takes four to six weeks to recover, compared to a Grade 1 that takes two to three weeks or Grade 3 that takes six to twelve weeks.

Neither the neck or shoulder condition or the ankle injury required clinical intervention and could have resolved with self-management but as a member of a Healthcare plan there is often an expectation of treatment whether required or appropriate.

6.1.13. Overview of psychosocial issues in an incapacity assessment

A case to illustrate the surface knowledge of practitioners of the BPSM related to the declaration of an incapacity pension of an individual, age 50-59, with bilateral osteoarthritis of the knee. This individual is a service engineer of organisation four and is required to kneel, crouch and crawl, drive, stand and walk as part of his daily routine.

A functional capacity assessment of his physical condition identified that he struggled in all of these activities. His GP and his surgeon both agreed that he would find continuing in this role very difficult but they only considered this from a physical perspective. He would be suitable at some stage for bilateral knee replacement surgery but he had been advised that he was still really too young to have this procedure.

A number of psychosocial barriers was outlined in the report from the functional capacity assessments including his beliefs that:

- He cannot perform a number of the tasks expected of him to perform his role include kneeling, squatting, crouching and crawling and has difficulty driving, standing and walking;
- He will never be able to return to work even in a modified capacity as his condition is degenerative and he will not get better;

- He is too young to have knee replacement surgery and that even post-surgery he will not be able to undertake his role;
- His fear avoidance in that he avoids certain activities that aggravate his pain.

In addition, he also had the following physical problems:

- Excess weight (BMI of 28kg/m²) and a reasonably high blood pressure;
- Inactive, which is currently associated with his knee condition but is likely to require further motivation to improve beyond his knee issue.

6.1.13.1. Declination of incapacity

A senior consultant occupational health physician (OHP) found that he did not qualify for an incapacity pension on the basis that treatment options were available in terms of surgery and other conservative options, including exercise. An obvious conservative approach would be attendance on a four-week rehabilitation programme targeted at the physical and psychosocial issues. The OHP did not mention this but referred to the fact that this individual did present with Yellow, Blue and Black flags based on the summary outlined above. What she did not consider however was how, given the depth of his beliefs would he be able to overcome his psychological state sufficiently to take him from a deconditioned 53-year-old with other physical problems, to someone who could actively engage in exercise sufficient to allow him to return to his normal duties or other similar duties.

6.1.13.2. Review of declination

He presented with both significant physical problems and ingrained beliefs that would be difficult to change without some significant motivation for him to change, which he did not appear to have. An assessment of the case by an expert in the BPSM suggested that this person would not engage in an FRP because of the fact he no longer wanted to work in his job and had no other social motivation to overcome his physical issues and his psychological barriers. This combined information was outlined to the trustees of the pension scheme, who decided to award the incapacity.

6.2. Conclusion

No single ontology or epistemology emerged nor did a single theoretical perspective. It was apparent that individuals are so very different and that many construct their world based on their experiences and exposures in life (constructionism) and that this resonated

with the research relating to the bio-psychosocial approach. Individual's attitudes and beliefs may also align with subjectivism and objectivism, suggesting that the bricolage approach allowed multidimensional perspectives to emerge from the documents.

Ethnographical aspects arose in relation to the anthropological roots of musculoskeletal health and the medical anthropological links with MSDs. Phenomenology was present in the individualistic nature of every case reviewed. Variances in interpretation, as outlined by Hale, Treharne, & Kitas (2008), were observed from differing attitudes, beliefs and fears that link with modern hermeneutics and symbolic interactionism. Action research evolved from the learnings obtained and which emerged during the process and where applicable discussed with the participating organisations, practitioners and healthcare providers with the NHS and private sector allowing a great understanding of the data and its importance.

6.2.1. Summary of findings

The thirteen cases selected for this chapter (Table 22) were those that considered a range of job types, and a range of underlying possible causative or contributory risk factors plus one additional case, which highlighted the complexity between the physical and psychosocial elements. Consistent themes were identified and analysed (Denzin & Lincoln, 2013) as the data emerged from the documents.

6.2.1.1. Age, gender and job type

Any reference to age and/or the rate of degeneration (normal or otherwise) was not made in the reports (or calls) by any practitioner nor was this mentioned in the case notes of conversations between the case manager and the symptomatic individuals.

The cases outlined in this chapter are insufficient to comment on gender specifically.

Whilst symptomatic individuals referred to the work causing them harm, (e.g. case 5, 6 and 7) very little consideration of either physical or psychological stressors of role and possible relationship with MSDs was referred to by the clinicians.

6.2.1.2. Additional work related factors

Identified across the three job types are outlined in Box 5, 6 and 7.

Box 5: Airline pilots

Work factors
<ul style="list-style-type: none">• Underlying issue associated with performance and responsibility;• Fatigue of shift work, time zones, and sitting for long periods in a confined space which lead to some individual participating in considerable activity whilst other feel they do not have the time or are too tired;• Being away from home;• Sickness absence rewarded by an income protection plan of 75% of salary to age 65 and a lump sum payment of £100,000 to £140,000 for loss of licence.

Box 6: Service engineers

Work factors
<ul style="list-style-type: none">• Long hours, especially in the winter months;• Sitting in vehicle often for more than four hours per day combined with manual handling;• Driving through traffic especially in major cities;• Lone working;• Often insufficient time for meal breaks;• Targets – pressure to visit all customers, and perform the necessary tasks in the allotted time;• Belief that vehicle can cause harm due to various messages that have been imparted by physiotherapists during different forms of training.

Box 7: Office based workers

Work factors
<ul style="list-style-type: none">• Sitting in a sustained posture;• Use of DSE equipment;• Targets and workloads;• Difficult customers;• Attitudes and beliefs associated with the provision of benefits.

6.2.1.3. Psychosocial factors

The only reference to psychosocial factors from the cases reviewed was from clinicians who are trained and specialise in this areas including those from the provision of functional assessment and rehabilitation (e.g., in Case 1, 2, 5, 6 and 9) and whom were contracted specifically to assess the individuals and consider the multifactorial issues.

6.2.1.4. Excess weight

Possible connection between weight and condition not understood by individuals where this was relevant. Also not considered by any of the clinician.

6.2.1.5. Activity

Individuals referred to within the case studies whether inactive or active did not consider any relationship between activity or lack thereof and their musculoskeletal condition. No evidence was found that clinicians considered the risk of inactivity, even though the impact on health including the musculoskeletal system is well publicised and has been an integral part of the NICE Guidelines on Low Back Pain (2015 & 2016).

6.2.1.6. Exercise

Case 2 and 4 performed exercise and the latter was a serious cyclist undertaking long distance rides. Whilst Case 2 was interested in exercise, he had no perception that as he aged the type, frequency and duration of form of exercise he undertook could have alleviated or aided the improvement of his medical condition. Although the rehabilitation programme did consider a form of exercise, this aspect could have been improved. Case 4 had specific exercise related problems, which he neither understood nor appeared interested in considering. His clinicians did not consider the physical and psychological stressors of many years of long distance cycling.

Table 22: Summary of findings from cases and documents reviewed

Case	Age	Gender	Condition	Job Type	Excess BMI	Inactivity	Relevant risk factors	Yellow	Blue	Black	Psychosocial obstacles to recovery	Risks identified by treating clinician/s
6.3.1	50-59	M	LBP	Flying & shift work	Y	Y	Inactivity	Y	Y	Y	Y beliefs, fears & compensation	N
6.3.2	50-59	M	LL	Flying & shift work	N	N	Needed corrective exercise	Y	Y	N	Y beliefs developed from clinicians	N
6.3.3	40-49	M	LBP	Flying & shift work	Y	Y	Excess weight/inactivity	Y	Y	Y	Y perceived injustice, attitudes & compensation	N
6.3.4	50-59	M	LBP	Flying & shift work	N	N	Sport needed corrective exercise	Y	Y	Y	Y beliefs & compensation	N
6.3.5	40-49	M	LBP	Driving & manual	Y	Y	Excess weight/inactivity	Y	Y	Y	Y beliefs, perceived injustice & compensation	N
6.3.6	30-39	M	HUL	Driving & manual	N	Y	Excess weight/inactivity	Y	Y	N	Y beliefs & perceived injustice	N
6.3.7	30-39	M	LBP	Driving & manual	Y	Y	Excess weight/inactivity	Y	Y	Y	Y beliefs, perceived injustice & compensation	N
6.3.8	30-39	M	LBP	Driving & manual	Y	Y	Inactivity	Y	Y	Y	Y avoidance & beliefs developed from GP	N
6.3.9	50-59	M	LBP	Office based	Y	Y	Inactivity	Y	Y	Y	Y damage beliefs, fear avoidant, compensation	N

Table 22 continued: Summary of findings from cases and documents reviewed

Case	Age	Gender	Condition	Job Type	Excess BMI	Inactivity	Relevant risk factors	Yellow	Blue	Black	Psychosocial obstacles to recovery	Risks identified by treating clinician/s
6.3.10	40-49	M	NS	Office based	Not noted	Y	Inactivity/ appropriate exercise	Y	Y	N	Y attitudes & avoidant behaviours	N
6.3.11	30-39	F	HUL	Office based	N	Y	Needed corrective exercise to return to activity	Y	N	N	Y catastrophic thinking & fear avoidant	N
6.3.12	30-39	F	NS	Office based	N	N	Possible poor form with exercise	N	N	N	No	N
6.3.13	50-59	M	LL (OA both knees)	Engineer	Y	Y		Y	Y	Y	Y ingrained beliefs that would be difficult to address	N

Legend

M = Male: F = Female LBP – Low Back Pain LL – Lower Limb – foot, ankle, lower leg, and knee UL – hand, wrist, elbow and other arm conditions NS – Neck, shoulders and upper back HUL– Hip and upper leg M – multiple, fractures and other	BMI > 25 kg/m ² Inactive < 150 minutes moderate/75 minutes of strenuous exercise per week Yellow – Attitudes and Beliefs Blue – Issues associated with work Black – Financial compensation Risk recognition – includes all risks outlined which in the author's opinion are relevant to a long term successful outcome and in a number of cases also impacted on ability to work and quality of life.
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Chapter 7

Study 2

Experiences of Symptomatic Individuals

7. Introduction

This chapter summarises the qualitative data obtained from symptomatic individuals, their treatment experiences and knowledge of possible latent underlying risk factors as outlined within:

1. A summary of the main themes identified from the individuals within the focus group and one to one interviews (Table 26);
2. A high level profile of the fifteen participants from whom the above themes and narrative outlined below were derived (Table 27);
3. Account of the experiences of the nine symptomatic service engineers, within the focus group, and the six individual interviews.

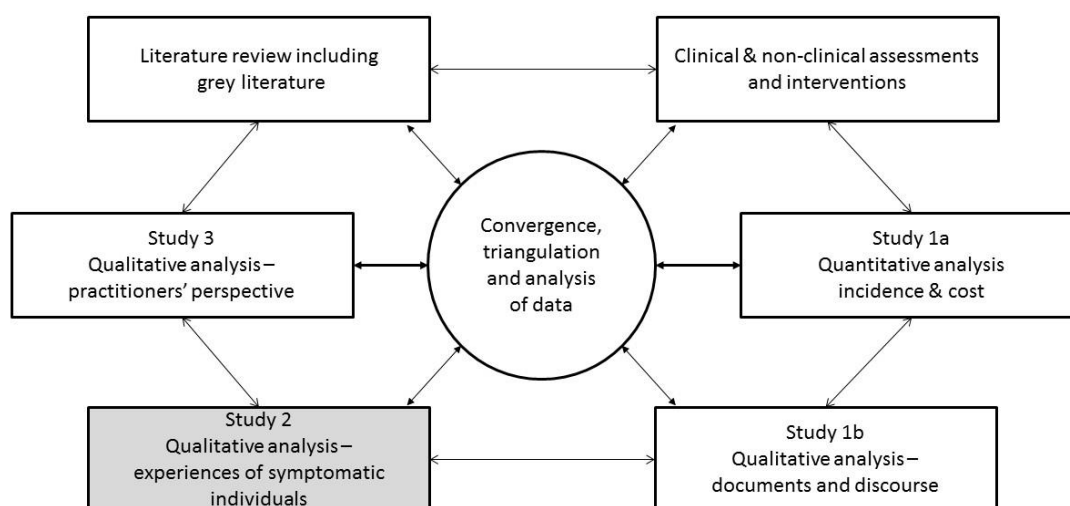


Figure 8: Explanatory sequential mixed methods research design – Phase 5

This study was informed by: the literature review, the findings from common clinical and non-clinical practice and the quantitative data outlined in Study 1a and the qualitative data outlined in Study 1b.

7.1. Summary of the main themes identified

The following table outlines a summary of the main themes identified from the fifteen participants.

Table 23: Interaction with theme, assessment and treatment process and latent underlying issues (n=15)

Theme	Relevant to diagnosis	Relevant to treatment	Relevant to successful outcome	Relevant to psychosocial factors	Relevant to weight	Relevant to activity and exercise	Relevant to occupation
Dissatisfaction with GP	GP regarded as generalist, with little understanding of MSDs.	GP able to provide medication and onward referral. Expectation higher	GPs not aware of outcome unless patient returns.	No evidence these were considered	No evidence that this was considered	No evidence that this was considered	No evidence that this was considered
Requests for MRI scans (patients)	Belief that these are necessary to diagnose MSDs.	May not identify causation and may or may not direct appropriate treatment.	Findings may not affect a cure	Belief that these are necessary to diagnose condition was evident in four individuals.	Not applicable	Not applicable	Not applicable
Dissatisfaction with physiotherapist	Patient expectations often considerably higher than a physiotherapists training.	Expectation of hands on treatment not self-help.	Patient expectations of being “fixed” in ignorance of multifactorial nature of MSDs.	No evidence these were considered	No evidence that this was considered	Considered by the sports physiotherapists treating the individuals.	No evidence that this was considered
Dissatisfaction with specialist	Expectation that the practitioner will provide an accurate diagnosis that is often not possible.	Expectation of being “fixed” and therefore not interested in conservative options.	Expectation that the treatment will resolve the problem when it may not or may make it worse.	No evidence that these were considered by specialists but should have been part of pain management.	No evidence that this was considered	No evidence that this was considered	No evidence that this was considered

Table 23 continued: Interaction with theme, assessment and treatment process and latent underlying issues (n=15)

Theme	Relevant to diagnosis	Relevant to treatment	Relevant to successful outcome	Relevant to psychosocial factors	Relevant to weight	Relevant to activity and exercise	Relevant to occupation
Failure to consider conservative treatments	Not considered during the diagnosis process	Only considered for two of the fifteen post failure of other treatments	Both individuals felt they understood more from this pathway than any other treatment	It was apparent that this was considered but to what extent could not be ascertained.	Not apparent that weight management was considered.	Not apparent that activity and exercise were provided as part of a treatment plan.	Not apparent that this was considered as part of a conservative treatment plan.
Work causation	No evidence work was considered as a factor yet in 13 of the 15 cases work was a factor.	No evidence work was considered in the treatment path	No evidence considered whether work could affect the outcome	No evidence that any Yellow, Blue or Black flags associated with work were considered	Evidence to suggest that this could be a contributory factor but not considered by 14 individuals in relation to work.	Work hardening or conditioning not considered.	Nine individuals (focus group) had firm beliefs this was the case but no evidence. Four others had issues.
Lack of knowledge of personal risks	One claimed to have knowledge.	Most (14) said they would like to know more.	No evidence that individuals realized that their longer term outcomes may be improved by reduction in personal risks	NA from any participant even those in pain management.	Most (10) did not connect excess weight with an MSD.	Little understanding of musculoskeletal health.	No understanding of work conditioning and need to be fit for work, especially as we age.
Feeling out of control	Lack of understanding of their pain and often a lack of a clear definitive diagnosis created a negative emotion in most.	Expectations of being "fixed" and then this not being satisfied could add to anxiety/depression relating to their condition.	Psychosocial factors were affecting the outcomes to a lesser or greater degree in circa 80% of these participants.	Management of psychosocial factors is key to helping a person regain control of their condition.	Excess weight may be contributing to some degree but this was not evident in any of these participants.	The lack of appropriate exercise in most would almost certainly contribute to this emotion. Taking positive steps towards regular exercise would help regain control,	Impact on work and absence heightened anxiety about ability to work in the longer term (11 cases).

7.2. Individual profiles

The following table provides a high level summary of the individual physical and psychosocial characteristics of the individual participants identified at the time of the focus group or during the interviews. The information relating to the focus group in this table and the following narrative and tables was based on comments made or visual observations by the author and supported by the view of the musculoskeletal specialist. The information in relation to the individuals involved in the one to one interviews was based on what the author was told on the day and supported by any clinical notes where these were made available.

Table 24: Observed individual characteristics

Participant number	Gender	Age/approximate age	Ethnicity	MSK condition	Job type	Weight	Activity	Psychosocial factors
1	Male	Early 40's	White European	Low back pain	Technical service engineer	Overweight	Inactive	Yellow flags
2	Male	Early 40's	Asian Briton	Low back pain	Technical service engineer	Obese	Inactive	Yellow flags
3	Male	Mid 50's	White European	Low back pain	Technical service engineer	Overweight	Inactive	Yellow and blue flags
4	Male	Mid 30's	African Briton	Low back pain	Technical service engineer	Normal	Inactive	Did not comment so difficult to assess
5	Male	Mid 40's	White European	Low back pain	Technical service engineer	Slightly overweight	Inactive	Did not comment so difficult to assess but interested in understanding more
6	Male	Mid 40's	White European	Low back pain	Technical service engineer	Slightly overweight	Inactive	Yellow flags

Table 24 continued: Observed individual characteristics

Participant number	Gender	Age/approximate age	Ethnicity	MSK condition	Job type	Weight	Activity	Psychosocial factors
7	Male	Mid 50's	White European	Low back pain	Technical service engineer	Slightly overweight	Inactive	Yellow flags
8	Male	Mid 40's	White European	Low back pain	Technical service engineer	Normal	Inactive	Difficult to assess in group
9	Male	Early 30's	White European	Low back pain	Technical service engineer	Obese	Inactive trying to run	Yellow flags
10	Male	53	White European	Low back pain & neck and shoulders	Accountant	Obese	Inactive (cardio) Does Pilates sometimes	Yellow and blue flags
11	Male	42	Asian Briton	Low back pain	Area manager (field based)	Obese	Lifts weights but no cardio	Yellow flags
12	Male	35	White European	Low back pain	Commercial team (engineers)	Obese	Active	Yellow, and blue flags
13	Female	50	White European	Low back pain	Project manager (clinical research)	Obese	Inactive but rides and goes to Pilates	Yellow and blue flags
14	Male	31	White European	Multiple	Project manager	Normal	Very active	Yellow flags
15	Female	61	White European	Leg injury	Housewife	Normal	Active (walking dogs)	Yellow flags

7.3. Individual observations – focus group

The following is a brief overview of each individual as observed and a summary of what that individual reported to the group.

7.3.1. Participant 1

This individual expressed dissatisfaction with the diagnostic process and felt that people need help to understand the mixed messages from the various clinicians. Having started a pain management programme, he believed this was the first time he had been given sound advice.

7.3.1.1. Case summary

This individual portrayed “yellow” psychosocial flags including: conflict and emotions from the mixed messages of clinicians; an expectation of the medical process that was somewhat different to reality and appeared to have little understanding of personal risk factors.

7.3.2. Participant 2

This person reported taking very little exercise due to fear avoidance behaviours following surgery (laminectomy/discectomy) to address an L5/S1 problem. He felt that this had helped to some degree but he was still in a lot of pain. He felt that the diagnostic process was complex and commented:

I have been given lots of different opinionsthe doctors do not understand and I have just started a pain management programme, which I hope will help.

7.3.2.1. Case summary

This individual appeared to display a number of different psychosocial flags including: fear avoidant behaviour following his surgery; conflict from the different opinions and that clinicians do not understand him; negative attitudes and beliefs; no apparent understanding of any personal responsibility and possible other undisclosed factors that were not explored due to the group setting.

7.3.3. Participant 3

This individual stated that he undertook very little exercise due to fear avoidant behaviour following his surgery as he had *lots of problems* with L5/S1 for which he underwent a laminectomy and then a discectomy. He was told by a surgeon that the laminectomy should not have been done and that this surgery had made matters worse. He was also

unhappy with the treatment received from a physiotherapist funded by his employer and felt that the clinicians were responsible and should resolve his problem but continued to report problems with the medical profession. He described nerve problems in his face, neck and arms; felt he had little understanding of nutrition and what food he should eat. From a work perspective he had issues with his job in the manner in which they need to access boilers, and move in small difficult spaces and thought the biggest problem was twisting but believed he had a high pain threshold.

7.3.3.1. Case summary

His use of words and the manner in which he talked suggested negative attitudes, beliefs and fears towards his musculoskeletal condition and towards his job. He displayed both psychosocial Yellow and Blue Flags including: ruminating on problem and events; conflict and mistrust of clinician; expectations not being met; not mindful of personal responsibility; behaviour suggesting low pain threshold and belief that work was part of the problem. These attitudes and beliefs are potential obstacles to his recovery and should ideally be addressed as part of his treatment.

7.3.4. Participant 4

Very quiet did not say much or engage in the conversation with his colleagues.

7.3.4.1. Case summary

Difficult to make any comment on this individual.

7.3.5. Participant 5

This individual also presented with postural problems including: rounded shoulders, forward head, with lack of mobility and flexibility all of which could contribute to his low back pain. He was slow in movement patterns and did not verbalise his views but was nodding and agreeing with many of the comments made by his colleagues. Following the session, he asked to be assessed and wanted to know more.

7.3.5.1. Case summary

It was evident from what he expressed after the session that he wanted to learn more to enable him to take more control and self-responsibility.

7.3.6. Participant 6

This gentleman stated that he had been involved at a reasonably high level with speed skating, but stopped at aged 22 and after which he did very little exercise.

On reaching forty, he decided to start exercising again and participates in cycling time trials. He said he would cycle at 90-95 rpm (a high cadence) but he did not comment on the length of the time trial or frequency and duration of training.

He outlined a problem with his low back, hip and shoulder which could all be connected but he expressed particular concern about his hip and felt that it was *something serious* and had arranged a GP appointment.

He also reported falling off his bike 12 months ago and recently fell down stairs injuring his shoulder.

During the session with the musculoskeletal specialist this man participated in an assessment which found he had: tight lower back on both sides; tight quads; tight ilio-tibial band; lack of pelvic stability and inability to activate transverse abdominus in a non-axial loading position.

He reported bad experiences with three different physiotherapists but had found one now that *was a lot better*.

7.3.6.1. Case summary

This individual described being *fit in his youth* and had then lost his fitness but having decided to return to activity and exercise faced a number of problems. He displayed a number of postural and biomechanical issues (hip, back and shoulder), as observed by the musculoskeletal specialist present, that could underpin what he perceives to be serious clinical problem and may also need a professional bike “fit” but this was not explored. He also presented with a number of possible psychosocial flags including boom and bust behaviour, failure to grade his activity for his age and damage beliefs.

7.3.7. Participant 7

This individual stated that he was run over by a car when I was thirteen which he believes was the start of his MSDs, and which left him with a leg discrepancy of inch and half. Over the years he had received lots of mixed messages about leg length and whether to use built up shoes to compensate.

As an ex-rugby player he had received a number of head injuries and although he had tried to undertake more regular activity he suffered every time not realising that he needed to grade his return to exercise over time as opposed to trying to return to previous levels of intensity and duration. He also commented that he had little understanding of nutrition.

He expressed lack of confidence in the medical profession and had no time for his GP having had to push for diagnostics and treatments. He had chased and chased for an MRI scan that identified spondylitis.

7.3.7.1. Case summary

This individual gave the impression that he is looking for someone to help him understand what he can do to help himself and that he would engage with such support.

He displayed a number of possible psychosocial flags including: serious damage beliefs due to his accident at a very young age; conflict of advice on leg discrepancy; boom and bust exercise behaviour; dissatisfaction with clinicians and uncertainty of exactly what to do.

7.3.8. Participant 8

Ex- football player with glucose intolerance. Mostly in good shape for age but had constant pain over years in back, hamstrings, calves and lacked mobility and flexibility.

7.3.8.1. Case summary

This individual did not participate as much as the others and it was difficult to ascertain any psychosocial factors but he did have apparent biomechanical issues that had not been addressed as observed by the musculoskeletal specialist present.

7.3.9. Participant 9

This man had become a father for the first time, 28 months earlier. He used to do martial arts and when he has a problem with his back (which happens every three years or so) does not bother to go to GP but goes straight to a physiotherapist. He recognised that being overweight does not help but believes that his problem is only his tummy. Has a problem with feet (he gets plantar fasciitis and foot pain) but trying to run and invested in a good pair of shoes for purpose.

7.3.9.1. Case summary

This individual had very little perception of the extent of his weight and believed that he only needed to lose weight around his mid-section. Although he recognised his weight does not help his low back pain he did not appear to recognise the problems that his weight could cause over time and this combined with the extent of his deconditioning could also be associated with his foot problems. He did not say when or why he gave up martial arts but his comments relating to how busy he was following the birth of his child could be surmised to have affected his social activities but this was not explored further.

7.4. Observations of the physical risk factors - focus group

During the first and second part of the focus group observations were undertaken by the author and a musculoskeletal exercise specialist and this data suggested the following risk were present within the group.

7.4.1. Musculoskeletal risk factors

Postural features noted in all participants: forward head; rounded shoulders; poor overall posture; lack of mobility and flexibility; tilted pelvis and tight lower back muscles. All suffered LBP with three or more L5 S1 problems (low lumbar region) and more than 50% had a range of other complaints including: neck; knee; hip; shoulder and nerve problems.

7.4.2. Other vocalised health risks

Other issues discussed included those in Table 25:

Table 25: Participant concerns

Topic	Nos. with belief
Nutrition	
Dehydration appeared to be an issue as they all worried about going to the toilet	9
A high carbohydrate and sugar diet was thought to be a good diet as it is low fat not realising the problems associated with sugar	8
Poor digestion was discussed and link to lack of good quality protein, vegetables, fruit, nuts and seeds and lack of regular exercise not considered	8
Tiredness	
Tiredness and lethargy in the afternoon and possible link to poor nutrition: sitting for long periods and inactivity not understood	7
Poor sleep	3
Weight	
Is not relevant to an MSD	6
Only obesity	3
Exercise	
Type, frequency, intensity of exercise beneficial to their health not known	8
Did not know that tight muscles (ligaments and tissue) could lead to injury and that conditioning exercises to combat the stressors of the job could help	9
Active when under 25	4

7.4.3. Comments on diagnostic and treatment process

A summary of these are outlined in Table 26:

Table 26: Participant assessment and treatment experiences

Comment	Nos. with belief
General Practitioners	
Cannot help as they are generalists, with limited time	7
Have limited time	7
Have little understanding of low back pain.	7
Had to chase to get treatment.	5
Treatment NHS or Private	
NHS	9
Private initial or additional physiotherapy	4
Physiotherapy	
Went straight to a physiotherapist	4
Had mixed experiences	9
Stated physiotherapist had made it worse	3
Wondered what happened post physiotherapy	9
Number of physiotherapy sessions not felt to be enough	9
Other Practitioners/Treatments	
Felt that they had received mix messages from different practitioners.	7
Felt MRI scan was an important diagnostic tool.	3
Was misdiagnosed	2
Was offered pain management	2
Had poor experience with a chiropractor	1
Latent issues	
Felt needed to maintain exercise and adapt to exercise regime	9
Felt underlying issues not addressed	9
Experience of biopsychosocial model	0
Understanding that negative attitudes, beliefs, fears and a range of other factors could be an obstacle to recovery.	0

7.4.4. Perceived occupational issues

The following comments were made that were associated with their job role.

Table 27: Participants' perception of their work

Comments	Nos. stating belief
Work was the cause due to the bending, stooping and especially the twisting but also the access to the boilers	6
Youngsters do not realise you could do "your back in" doing the job	4
Understanding that their personal risk factors increased their work risks	0
Felt current communication methods ineffective on how to prevent and manage MSD's.	9

7.5. Findings from interviews with symptomatic individuals

The following is a synopsis of the findings from the interviews and the language used in summarising the conversation which each person reflects the language used by the individual. The comments in italics are direct quotations.

7.5.1. Participant 10

This individual reported taking no form of what he termed formal exercise in that:

I do not run or I do not have gym membership but I did try to lose weight and recently lost three stone and to help me I did have a personal trainer.

A loss of three stone would mean that from his current BMI of 30.9kg/m² he would have meant he previously had a BMI of 37.4kg/m² (potentially morbidly obese).

He outlined a number of musculoskeletal problems:

My first problem was with my neck and shoulders I had pins and needles so went for an MRI scan. They found a disc pressing on my spinal cord. I was told I would need surgery but then I was told it should resolve over time.

Alongside this I had mid and lower back problems but the referral to the surgeon was protracted and in the meantime I was in excruciating pain. So I paid for a private consultation but then was not easily able to get back into the NHS.

The surgeon wanted to take a conservative approach and said that there was not really a surgical solution and that he could not do much for me. I had little response from physiotherapy and I found the NHS ineffective.

He then decided to fund some other treatment privately:

I had some sports massage from a therapist who specialises in stroke rehabilitation and who appeared very enlightened and a personal trainer

gave me some core strengthening exercises that gave me a positive result for my mid and lower back.

When asked about his posture and especially in relation to the fact that he worked at a desk all day he described a noticeable forward head. He had no understanding that the presence of a forward head could be a causative or a contributory risk factor affecting his neck, upper and lower back problems.

He described poor positioning at his desk at work and at home but related the fact that he thought he knew how to set up his home office and now had an office chair which he thought would help.

In relation to his treatment he said:

The physiotherapy did initiate some exercise and he gave me a latex band to use did minimal manipulation. I think chiropractors are better and I did think about going to a chiropractor but decided not to due to the disc problem. The physiotherapist suggested Pilates, which I did but these classes were disappointing as they were not as intensive as they needed to be and were full of women. There were so many different levels of ability in the class but I get more pain from doing Pilates. If it is going to be offered it needs to be done effectively.

He revealed later in the conversation that his partner was a massage and Reiki therapist who also did yoga and Pilates.

It was at the point of his frustration with the physiotherapy and the Pilates that he considered what else he could do for himself and decided to lose weight. Having lost three stone, he said that he would like to lose one more, to achieve what he feels is an ideal weight for him. He felt that what he has learnt is that food consumption is critical and he now believes that his excessive consumption and weight had led to his musculoskeletal problems. He continues to maintain a calorie controlled diet and initially eating out was taboo.

He outlined a sample of his diet that is based on Weight Watchers and which he feels is really healthy stating the following:

I have fruit and fibre cereal or Special K with red berries for breakfast;

Salad for lunch based on low points;

Don't use seeds or anything like that;

I have 100 to 150 grams of meat;

Tea is a free item so I have two cups of tea and a cappuccino;

Snacks are low calorie crisps because they are only 2 points rather than 4 points for normal crisps.

He described his hobbies as: photography, amateur dramatics and DIY but said that he could not do these activities when he was suffering with his problems.

He now feels better in that he has:

Changed his clothes to a smaller size;

Parks his car further away so that he has to walk half a mile;

He climbs up and down the stairs;

His heart rate is good and a major learning was using a rucksack rather than a bag on one shoulder.

He feels negative when he is not progressing but now understands more the link between what causes pain and what gives him relief.

He did refer to his age in that he said:

These things happen as you get older.

Towards the end of the conversation he revealed that his friend had been in a serious car accident and was now in a spinal unit. He had suffered *lots of broken bones and had a collapsed lung.*

Also almost as a throwaway line at the end of the conversation he said that work should not be ignored – which could suggest that this was important but as he needed to finish the interview this was not pursued further.

7.5.1.1. Case summary

During the one-hour conversation with this individual his tone and manner suggested a form of anger or frustration. He was dissatisfied with a number of factors including: the NHS; the NHS physiotherapist and the Pilates class. What was not clear was whether there was an underlying cause to his emotion and it is possible that this could be influenced by a number of contributory factors including: possible concern over his friend; anger that the clinicians had not told him to lose weight to help his musculoskeletal problems and that he had to find this out for himself and could of lost weight sooner and a possible issue with work.

Excess weight and inactivity have significantly contributed to the musculoskeletal problems suffered by this individual (as accepted by the gentleman himself) and will have been

exacerbated by the sustained posture at a desk and possibly several psychosocial factors that require further investigation. A significant factor in his ongoing motivation to help himself is that he now feels more in control, a known psychological construct where feeling in control can aid recovery and reduce the risk of ongoing stressors from feeling out of control or lacking control (HSE, 2000).

7.5.2. Participant 11

This gentleman was at the time of the interview 6ft 1in tall and 17 stone which placed him in the obese category with a BMI of 31.4kg/m². He described his role as one which involved lots of driving and meetings with circa four to five hours driving in 45 minutes to one hour stretches between locations. He mentioned that he drove a Prius but felt that the seat was not very supportive for his back and legs which is possible due to a combination of his height and weight.

He described his main musculoskeletal problem as low back pain with acute onset of disabling features quoting problems with L3, 4, 5 & 6.

He reported that he attends the gym three to four times a week, normally in the mornings, mixing weights and cardio. The exercises normally performed using the gym equipment include: squats and leg press machine; and work on inclined bench using 25kgs in each hand as part of his strength and conditioning regime. For cardiovascular exercise he said that he used the bike and the cross trainer but did not comment on duration, resistance or intensity. He mentioned that he had a problem with his left knee which occasionally interferes with his squats. (Following the interview he developed a problem with his right knee, which he reported to the case manager he had experienced for two years, and was referred for a knee arthroscopy in 2015 and further treatment for his back in 2016).

He said that he did no exercise outside of the gym other than if he went out with the kids but one of the reasons for not exercising outside was that he stated that he does not like the weather.

He commented:

I have now found a really good physiotherapist having previously had a physiotherapist that was useless. This guy however is excellent and does manipulation and soft tissue work.

In his clinical notes that were reviewed post the interview the physiotherapist reported that he did mobilisation of lumbar facets and soft tissue release to hips and retrained him in postural and stabilising musculature and correct movement patterns in exercising.

In relation to nutrition he outlined the fact that he does not stop during the day but then he eats like a monster when he gets home. He loves his wife's curries, rice and breads. He also raids the kid's crisps and sweets.

For breakfast he has tea and two slices of toast. Lunch he has nothing. He drinks about six to seven cups of tea a day but very little water. He loves fruit juices and sugary drinks, which he drinks during the working day. He enthusiastically said:

Pineapple juice is incredible.

He explained that his GP is brilliant. He had given him nutritional advice and had told him it was just habit, he told him:

If there is something you can put off until tomorrow it is not worth doing.

The GP told him to eat five meals a day and to eat protein, carbohydrates and fat but from this gentleman's comments he did not appear sure as to what the GP meant by this statement.

He admitted that he had never looked at his diet for forty years but he had put on weight. He was always concerned that if he went on a diet he would lose muscle and he did not want to lose muscle.

He frustratingly said:

I don't know what I am doing.

He proudly stated that his father was a physical example and won two major competitions, two years running in his youth but sadly became a heavy smoker and had three heart attacks in his forties. He also suffered from diabetes. He did not want to become like his father and his mother also had diabetes and cancer and had to help with the care for her.

He explained he was very happy with his life but said:

I have got a big fat belly.

He said that his initial musculoskeletal injury started after:

Lifting a few bags and lifting one of my kids who has special needs off the loo.

Something went twang and I stayed standing for a while.

He went to his GP:

To get a painkiller as back was going into spasm and especially if I do anything physical.

He then reported laying a path in the garden and had to go to hospital. He said he would normally go to his physiotherapist to get sorted out but the physiotherapist decided to refer him to an orthopaedic specialist.

His clinical notes from his sports physiotherapist reported finding:

Residual stiffness and dysfunction elsewhere in lumbar spine and hips. Residual loss of deep stabiliser endurance and firing speed. Residual loss of flexion and rotation control for long held postures and occasional lifting.

He then had an MRI scan, which suggested he has two dehydrated discs and an S1 Herniated discs. (L5/S1 and L4/5 were dehydrated with facet wear and L3/4 had a right tear and bulge).

This scared the living daylights out of me.

He stated that the consultant said that he had three options:

1. Exercise, physiotherapy and painkillers;
2. Steroid or cortisone injections (he could not remember which);
3. Surgery.

He did not want to go for options two or three and preferred to embark on the first option.

When he has a bad episode he ends up on the floor and tries to manage both his pain and his dysfunction by doing lying on a hard surface until he starts to feel a little better. A friend had a similar problem and had a discectomy.

When I am in pain I do not know what to do – all I think about is getting back on my feet. I do get depressed and when I do I think of surgery but it comes from not knowing what else to do. The last episode was severe pain in my left side and I could not stand up and I could not bend so hung onto the sink. I move with the fear of injury.

When asked to describe his posture he thought that he was quite upright but felt that his head did lean forward, that his arms and shoulders are broad and

I have had this belly for seven to eight years.

I noticed the change when I was about thirty, when I was younger I was 87kgs and slightly overweight but never worried about how I looked. I do not wear tight clothing and I do not drink alcohol or smoke. I am Muslim and never really thought about starting to drink.

I would really like to get a black belt in Taekwondo.

The problem is being Asian we are so mollycoddled and so idle. We use food as a comfort. Young blokes get married and then they stop caring. Also I do not leave any food on a plate as I feel I am being ungrateful to God if I am blessed with food.

I really think it is now time to do something about this – nothing is going to stop me.

Between this interview January 2015 and April 2016 it appeared that he had lost 10kgs and had a BMI of 28 kg/m².

7.5.2.1. Case summary

This individual presented with a number of possible psychosocial flags that were potential maintenance factors and obstacles to his recovery including: fear avoidant behaviour due to the severity of his acute episodes; conflict of opinions and use of language from practitioners which are well known psychosocial flags. In addition, he had other underlying family problems with a disabled child and the ill health of both of his parents combined with a stressful job and frustrations with his own procrastination.

Other contributory factors were his excess weight and distribution (around his middle); possible poor technique at the gym (which his sports physiotherapist had commented on); lack of other forms of exercise; and inappropriate appetite and type of nutrition.

7.5.3. Participant 12

This individual outlined his height as 6ft 2in with a weight of 15 stone but having peaked at 17 stone therefore he had been obese (BMI 31kg/m²) but had reduced to being in the overweight category (BMI 27kg/m²).

He described his role as a being part of a commercial team of engineers working with local authorities which was very stressful.

He said that he always had back problems at L5 and slipped disc 5-6 years ago. (L5/S1 four years ago). Generally, he described having a weak back with acute spasms and finds that lifting and driving a manual vehicle aggravates the problem whilst losing weight and being aware of his posture has helped.

He plays squash twice a week and knows that exercise is good but that squash is probably not the best exercise for him as he had experienced a problem after a game. He used to do more regular exercise such as running but stopped and has now started more recently a different circuit group which is tough. He said that his physiotherapist had mentioned that his core stability needed attention and so he knew he needed to do something.

He had a bad appendix operation and had a pelvic abscess (10 years ago).

From a treatment perspective for his problem he has received cortisone injections for his discs, which are dehydrated. His physiotherapist had given him three sets of exercises to do daily but he said that he does not always do them but knows that he has tight hamstrings and that his core stability needed attention and that this is part of his problem.

He also said that:

Feels quite stressed and has found mindfulness beneficial to help him get "head space". Often has to stay in hotels that he knows are his enemy.

Knows nothing about nutrition but knows he does not eat enough fruit and vegetables. He also knows he eats too many biscuits. He likes pasta and tuna. Does not smoke. Used to drink alcohol but hardly anything now.

Matters seem to be getting worse and believes this may be now the time to consider changing jobs. He struggles with certain things and has depressive thoughts for which he takes anti-depressants. He has accessed CBT via the Healthcare plan to help.

7.5.3.1. Case summary

This man presented with a number of apparent psychosocial factors including: dislike of job due to high levels of stress; depressive thoughts; language used by clinicians; and negative behaviours. He was aware that his excess weight; lack of core strength, conditioning and flexibility; insufficient activity, appropriate exercise and poor nutrition all contributed to his problem but he had found this out the hard way.

Without further information it is difficult to know what was the primary factor and whether this was associated with his work or whether his behaviours have led to his dissatisfaction at work. It is possible that with further information that other psychological factors exist that underpin both of the above but if there are they were not discernible from the interview.

7.5.4. Participant 13

The lady stated that she was 5ft 7ins and 16st 7lb (having lost 8lb) which places her in the obese category but she would like to reduce her weight to 12 stone. She works mostly from home as a project manager in clinical research. This involves spending a lot of time sat at her desk. She tries to ensure that she uses a docking station suggesting that she uses a laptop.

She spends a lot of time outside with four horses and five dogs to exercise. She feels describes herself as very muscular and can work the entire day in the garden with no problem at all which if true is likely to increase her BMI as muscle weighs significantly more than fat.

Her view was that her nutrition is not as good as it should be and she has a large glass of wine every day and used to smoke 15 per day, has a positive cough and now uses electronic cigarettes.

She said that she had low back pain with osteoarthritis in L2, 3, 4, and 5 (L3/4 rupture 18 years ago treated with steroid injections and rhizolysis 2 years ago)

Her attitude to life and her pain is:

Just get on with it.

She feels her orthopaedic consultant is very good but that in general:

GPs do not have a clue.

She used to be a nurse and felt it pop one day when lifting a patient. When she does any heavy lifting now though she tries to protect her back.

She described her MRI scan was *not a pretty sight* but not sure that this explains where the pain is. She has no trigger when she gets a problem but tries to mobilise as soon as possible. She does not take any pain relief but described having developed coping strategies and being:

Very aware of body and signals to avoid not being able to walk and when I feel something is starting I do something very quickly.

From a treatment perspective she has had facet joint injections and these seem to work and she has physiotherapy privately including acupuncture.

Access to her clinical notes from her physiotherapists found:

Standing in hyper lordosis limited flexion and range of movement limited by pain, mechanical LBP associated with fear avoidance of flexion.

She also finds riding good and goes to Pilates.

She wears baggy clothes because they are easy especially as she carries excess weight around her waist which she was quite conscious of and knew it was not good for her.

She gets stressed at work stating:

I work with a useless team, problems with budget and working with different personalities.

She described having “crap food” when working and enjoying her wine (large glasses) and now vaping having given up smoking.

In the past:

Life was always about money when I was working for the big pharma boy.

Timelines were always tight and the top bods placed everyone under pressure and the techy’s were run off their feet.

Nobody took note of the psychological pressure:

I was not coping so needed to change environment – 10 years ago;

Now I have a fantastic line manager but you have to manage yourself;

You have to have a positive outlook and not let anything beat you;

I think of myself as a tough cookie;

My parents were very stoic and I have learnt from them.

7.5.4.1. Case summary

This lady appeared very aware of her physical problems and that she needed to lose weight to help not only her musculoskeletal problems but also her general health. Although she suggested she was energetic she also admitted enjoying large glasses of wine and not eating as healthily as she should.

Psychosocially she portrayed: a boom and bust attitude but without realising that she sometimes undertakes too much and causes a relapse of her condition; problems due to conflict in advice citing her GP as the problem; language used by clinicians may have led to damage beliefs; as a previously trained nurse this may mean she is more fearful of her MRI scan and she did not express an understanding that the findings on the scan may or may not be relevant to her condition. Although she presented as someone who had a very positive outlook on life she did outline that she found her job stressful and eluded to possible other underlying issues, which do not appear to have been explored by her clinicians to establish whether they may or may not be relevant.

7.5.5. Participant 14

This gentleman stated that he is very physically active due to his involvement in Mixed Martial Arts (MMA) and kickboxing. He believes that his weight (15st 5lb) is all muscle weight and hence this will affect his BMI.

In the very early part of the conversation he stated that he was separated from his wife with two children aged five and ten years which appeared to remain quite poignant to him.

He outlined his job as an office based project manager that he found very stressful especially when organising conferences.

He stated that he went to the gym every day doing weights for one to three hours and due to his sport and the work at the gym believes he has a good understanding of his musculoskeletal structure, knows his form is very good but that he needs to work on flexibility. He outlined that his thigh muscles take most of the strain and that he has tight hamstrings but uses a foam roller to tackle the tightness from training and fighting.

He described having changed his diet from 60% to 90% being cheese and pizzas to a very strict diet low in carbohydrates other than whole grain pitta bread and that he eats a lots of meat (veal, venison, steak and chicken) and lots of raw vegetables. Uses chocolate milk for recovery and glucosamine, cod liver oil and flax seed oil as supplements.

He outlined considerable problems with his neck and used a chiropractor for support having found physiotherapy limiting. He had experienced a slight cartilage tear in his knee when he was 22 years old for which he had acupuncture. He also said he suffered a hip abductor problem, which was getting worse and that his hip clicks and becomes swollen and he knows that he needs to increase his flexibility in his hips.

He said he was very much into self-help:

The more effort you put in the more you get from it.

He outlined that he had now found a good physiotherapist who tried both trigger point release and acupuncture but as this did not really help he was then referred to an orthopaedic surgeon for an MRI Scan which identified a labral tear and bone abnormality in his right hip for which a hip arthroscopy was recommended.

He described how his hamstrings and piriformis are also an issue and that he had stopped kicking as it was this activity that seemed to aggravate the problem and he then started boxing instead. He also mentioned: a left Achilles and calf problem following an Achilles

injury which still flares up every now and again, tennis elbow in his right arm and nerve problems in his neck.

A review of the clinical notes for this individual identified an extensive range of other issues and eight claims on the healthcare plan. These included:

August 2012:

Ankle problem from playing indoor football but then bitten by insects. Ankle swelled severely so went to A&E and given seven-day course of antibiotics for the insect bite but then told it was a soft tissue injury.

January 2013: Physiotherapist report:

Returned to running and MMA but still getting dorso-lateral foot pain in region of 4th and 5th metatarsal. Discomfort on palpation of the tib post tendon behind the medial malleolus. Some discomfort also palpating the dorsal mid foot laterally. May have underlying tib post tendonitis. His lateral foot pain maybe resolved with slightly altered gait pattern (which was not evident at the examination). It is possible he has some chondral change to the lateral lisfranc articulations also. Possible early arthritis.

MRI scan showed fluid around FHL and FDL but the tendons and tib post appear normal.

Small line on the MR of his 4th metatarsal which probably represents a vascular marking but it may also be a healing stress response.

May 2013: Referred to consultant in relation to his right hip problem that he attributes to the time he injured his ankle. The hip remained symptomatic with anterior pain, stiffness, locking and popping. This hip shows mild reduction in external rotation by 10 degrees.

Clinical impression suffering from femoro-acetabular impingement and possible labral tear.

MR arthrogram showed small paralabral cyst. Recommend hip arthroscopy. This may give him 75% to 80% improvement so he can return to MMA but there is a 5-10% chance of deterioration and Osteoarthritis.

He decided not to proceed at that time.

September 2013:

Tennis elbow lateral epicondylitis treated by physiotherapy.

January 2014:

Achilles problem post training in December.

May 2014:

Right knee pain – popped when he was turning to come downstairs some pain and bruising and swelling advised of previous cartilage injury. Resting following a competition in April. Still attending gym. Right meniscal tear and median nerve irritation. Prescribed six sessions of soft tissue massage, trigger point release, deep transverse frictions mobilisation, quad strengthening exercise and advice.

October 2014: Multiple problems.

Tripped when exercising, landing heavily. Has since had pain in left elbow, left Achilles and right hamstring which he reported got very tight and snapped during training. Not able to do MMA and elbow remained a problem.

August 2015:

Neck and Upper back cracking noise when turning head to left. Tightness in upper traps some postural pain in right shoulder. Eight weeks ago was sparring and hit on top of head and seemed to impact head, down into neck. Also experiencing occasional right arm numbness. Pins and needles that radiates and move towards neck, which is stiff. Referred for chiropractic treatment with acute moderate cervical thoracic facet dysfunction after which reported ninety percent improvement.

November 2015:

Forearm and elbow. Went back to training 3 weeks ago (having stopped for 2 months) and pain returned to elbow. Numbness if elevated. Also having chiro for neck. Elbow treated with physiotherapy and RICE.

7.5.5.1. . Case summary

The clinical evidence in this case was extensive and confirmed the multiple injuries from his sporting activity but combined also with some other very unfortunate incidents. His regime suggests: he may be overtraining with insufficient time allowed for recovery; may have muscle imbalances that could benefit from correction and does not appear to consider graded activity or sufficient variation in his exercise to maximise the benefit from his training. Nutritionally he prefers to eat to keep lean and muscular, and may not be fuelling appropriately for his training or his recovery which he admitted he would like more help with.

Psychosocially although this individual claimed he was very knowledgeable about his body his summary of his musculoskeletal problems and the extent of his injuries suggest that he has gaps in his knowledge. He also portrayed potential: boom and bust behaviour; lack of

acceptance that he may be causing damage to his body or reflection on the possibilities of other sports to aid with his cross training and reduce the risk of injuries or as an alternative to MMA; possible underlying drivers associated with the separation from his wife and children; stressful job and conflict with clinicians which may also be driven by his attitudes, beliefs and determination relating to his sporting activities.

7.5.6. Participant 15

This lady suffered from a very unfortunate injury to her leg by her dog that was exacerbated by problems from the initial diagnosis and following complications. Her role is a housewife as she is married to a Pilot who is away from home. Her passion is her two dogs (golden retrievers) who she walks twice a day for a total of one hour and forty minutes.

The initial walk is a more leisurely pace with a friend whilst she described the second as a “*fast pace*” but she did not state what that pace was. Described herself as a keen walker and did Ben Nevis that on the sign suggested a five-hour walk, in four hours and thirty minutes. Undertakes obedience training with the dogs and enjoys cycling along a five miles cycle track near to her home. She is also a keen skier.

Her knee injury occurred when her mother in law passed away and her younger dog ran into her and knocked her to the ground having hit her quite heavily about two inches below the knee (lateral lower left leg x-ray, nothing abnormal detected).

Went to Accident and Emergency (A&E) where she waited four hours. She was assessed by a nurse, who: “*pulled her leg around*” and concluded it was a ligament strain. As she could not walk, she believed it was more severe than a strain. She went home was then contacted by her doctor, who told her she had broken her leg.

Access to the clinical evidence (May 2015) confirmed:

ACL rupture, proximal MCL sprain and lateral tibiofemoral bone contusion, almost certainly associated with a non-displaced fracture of the lateral tibia condyle.

She put a ski kneecap brace on to walk around as was told that she would have to wait for an appointment with the fracture clinic, which she advised would be a few weeks. Her husband complained and he was advised that she should go to A&E. Twelve days after the fracture she had a leg brace fitted and told to keep her leg elevated.

Access to the clinical information (November 2015) found:

Lateral collateral and medial collateral ligament injury. Loss of muscle bulk, strength and experiencing stiffness.

She then went to the fracture clinic again mid-December and sent for an MRI scan in January. She saw another doctor who she described as “*not helpful*” and he advised that she needed physiotherapy once a week for eight weeks. She eventually had another ten sessions after this. The MRI scan and X-ray were inconclusive as to what had actually happened.

The clinical information stated: *MRI suggests MCL tear and Consultant diagnosed fractured tibia.*

During the period of inactivity, she suffered muscle wastage and her hamstrings seized up. She was advised that she had a partial tear not a complete tear and given a smaller leg brace.

She found the experience very frustrating and felt she had wasted a good part of a year. She thought that the one NHS hospital was “*absolutely abysmal*” especially as they had asked her how much she had had to drink when assessed, which she was appalled by. The first doctor, a young Chinese gentleman, was very sympathetic but the second doctor was rude, old school and brutal. She then went to a minor injuries unit that was brilliant. From there she also had more physiotherapy privately. She believes her GP is very good.

She had not been able to ski since her injury and had another holiday booked in March, which she was determined to go on even if she cannot ski. Her husband is an Airline Pilot now working long haul so he is away a lot – so holidays are a special time.

She said:

if I can do something I will jolly well go and do it.

She appreciated she had to rebuild her leg gradually and thought whilst on holiday she could go on the treadmill and in the swimming pool. Believes that she and her husband lead healthy lifestyles. They eat very little meat and are mostly vegetarian. She drinks two glasses of wine a day, six out of seven days and has never smoked.

She has a positive mental attitude: always a trier and never a quitter; Mother negative but Dad had a can do attitude; did well at school and got on with life – did what she had to do; parents cosseted her and was a funny life as they were alcoholics.

She feels she has to get on with it and is doing what she has been told by the doctors and physiotherapists plus she has to get fit for Crufts so she needs to push herself.

7.5.6.1. Case summary

This lady had a very unfortunate escalation of problems following an injury caused by her own dog. She believes that the way in which her injury was assessed and treated, by the NHS, is what caused the complexity of her initial problems and then exacerbated further – a logical belief from her experience.

Psychologically this was difficult for her to overcome given the ongoing problems that loss of quality of life that resulted.

7.6. Conclusion

The themes identified in this study are consistent with the findings in study 1b namely: the range of possible underlying causes and contributory risk factors are complex and multifactorial; that individuals do not understand these risks and what they can do to help themselves and that in many cases the practitioners do not assess or address these risks. The findings from this study informed study 3 (chapter 8).

Chapter 8

Study 3

Practitioners' perspective

8. Introduction

This chapter has been informed by the document analysis conducted in Study 1b, Chapter 5 and the information collated in Study 2, Chapter 6. The purpose of this study was to consider the assessment and treatment process from the perspective of the practitioners involved in both NHS and private practice. The definition of practitioner in this regard covers both clinical and non-clinical personnel involved in the assessment, treatment or management of musculoskeletal provision outlined in chapter 1.

The practitioners included in this study are: case managers; general practitioners; physiotherapists; osteopaths; orthopaedic physicians; orthopaedic surgeons; sports and exercise physicians; corrective exercise specialists; functional rehabilitation specialists including a CBT specialist in musculoskeletal medicine and physiologists being trained in the conduct of a functional movement screen developed by the IHMP from an overhead squat (Hirth, 2007). Non-clinical individuals included a manager from a Clinical Commissioning Group (CCG) involved in a project to identify and develop a new approach to the management of musculoskeletal medicine and senior managers within a Health and Social Care Trust.

Other bodies represented during the interviews or meeting during the research process included the President of the British Institute of Musculoskeletal Medicine (*organisation now ceased*); a major provider of private physiotherapy services; a senior physiotherapist involved in the delivery of an FRP; a major international insurance company and two major Wellbeing providers.

This study was conducted following Study 2. Initial data from Study 1b and Study 2 were used to inform this study and data from this study then fed back to further inform those studies and enable a broader perspective to be taken on the data.

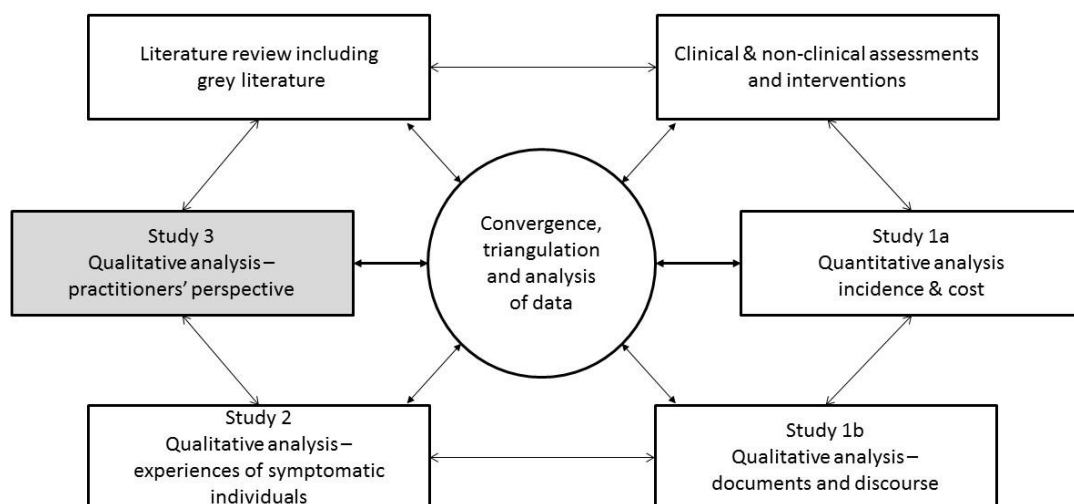


Figure 9: Explanatory sequential mixed methods research design – Phase 6

8.1. Clinical and non-clinical benefit managers

These practitioners were responsible for the initial assessment, treatment and management of all factors affecting the symptomatic individual, the impact on their ability to work and the funding of treatment from a range of healthcare plans or services that the individual may have access to as part of their benefits package provided by the participating organisations.

8.1.1. Case and claims managers

The role of a case manager is to assess an individual across the range possible access routes outlined in chapter 1. This case manager will then, dependent on their assessment, either refer to an internal or external physiotherapist for a more detailed assessment of the individual's musculoskeletal condition or may refer directly to another external practitioner e.g. orthopaedic or sports physician. When aiming to access benefit (e.g. wishing to make a private healthcare claim) or having been referred by their manager (management referral), the symptomatic individual may or may not have seen their GP and may be suffering from a new or ongoing musculoskeletal problem.

The case manager should identify during the assessment process: the presenting symptoms; the onset of the condition; and/or ongoing nature of the condition; details of any treatments received to date if not known; nature of their work; height; weight; BMI; activity; exercise; strength and conditioning; psychosocial factors and any other relevant

data specific to the individual or their work. A summary of their comments are provided in Box 8.

Box 8: Observations made by case managers

Extracts from verbatim quotations:
<ul style="list-style-type: none">• Individuals with access to Healthcare plan benefits think private is better (female, mid-thirties);• They believe treatment is their right and just want us to refer them for a scan or for a consultation even when the problem is a minor one (female, mid- twenties);• Some individuals can be very rude and aggressive towards us whilst other individuals are lovely and really appreciate our help (female, late twenties);• Some people just expect a quick fix (male, early forties);• People do not want to help themselves sometimes (male, mid-thirties);• The pilots, when they get what we do really understand it but some are just fed up of flying and they want to use their condition as a reason to access benefit and not have to work (female, early thirties);• The engineering managers just want us to refer their employees for physiotherapy because they think this will get them back to work and they do not understand all of the issues especially where these are psychosocial (female, mid-thirties).

8.1.1.1. Observations

The case managers are normally dealing with individuals who are hoping to access support in some form. This may be to: justify a sickness absence; obtain treatment to facilitate a return to work; access treatment that they believe they need and/or justify a group income protection claim or incapacity. Individuals may be cooperative or may become aggressive if they cannot access what they want even if the requested treatment is deemed to be neither appropriate nor necessary.

The case managers are often in a very difficult position, as they may have to engage in sensitive conversations that, for example, may confirm that the person is fit to work, when the individual does not wish to return to work. They may deny access to treatment requested by an individual, which, the individual believes they need but which is not evidence based or covered under the rules of their healthcare benefit. In such cases, a symptomatic individual may become difficult and even abusive. Conversely, they also engage with individuals who do understand and appreciate that the role of a case manager is to obtain a clear assessment of an illness, what treatment is required and what impact this has on an individual's ability to work in the short and longer term and appreciate the assistance.

They continually face the issue of interpretivism where language, used by employees, line managers and practitioners can vary and implicate understanding. These constructs may be influenced by a range of other factors including age, gender, experience, ethnicity, culture and occupation and affect the way in which the parties view their discussion. They may adapt and change over time increasing the complexity of assessing and treating our individual differences (Cooper, 2002).

8.2. Clinical practitioners

Practitioners with medical training from different disciplines.

8.2.1. General Practitioners (GPs)

Various informal meetings took place over the three-year period with either groups of GP's or one to one discussions which allowed conversation or discourse analysis as defined by Crotty, (1998) and Keller, (2011), which often produced more unrestricted comments than a formal interview (Box 7). All GPs were involved in normal day-to-day general practice working within the NHS.

Box 9: Comments provided relating to patients presenting with MSDs

Summary of GP concerns
<ul style="list-style-type: none"> • We do not have the time to spend with people and we have other more important matters to deal with (male, early forties); • We do not have any training in detail on the musculoskeletal system and often don't really know what to do (female, mid-thirties); • I tend just to refer on to the physiotherapists (male, early fifties); • We get revolving door patients – they come back and back again and we do not know why (female, late thirties); • We know nothing about any occupational issues and yet organisations and occupational health providers expect us to comment on fitness to work (male, mid-forties); • Fitness to work is not our job (male, early forties); • Individuals just expect us to fix them (male, late forties); • Some people demand to be referred for a scan or want to see a consultant and get very upset if we do not send them (male, mid-forties); • People need to take responsibility for their own health (male, mid-forties); • There is nothing we can do to get people to lose weight it is just so difficult so what is the point (male, early thirties); • We would just like a physiotherapy service to work alongside us so we can just refer to that and this new system is supposed to offer that but as yet we have not seen that it will (female, mid-thirties).

8.2.1.1. A GP involved in a local county federation of GPs

This GP, in her position of local representative for the federation, was representing GP's at an NHS partnership committee meeting. She commented on what she believed her colleagues were looking for in relation to the proposals to consider direct self-referral of patients to a physiotherapy service as proposed by the Chartered Society of Physiotherapists (CSP):

Box 10: Opinion of GP issues

Summary of comments
<ul style="list-style-type: none">• GPs just need help to reduce their workload in this area. They have high expectations of outsourcing to physiotherapists but it does not look as though the new model in our area certainly, is going to deliver what they thought and what they need;• GPs just need to be told what to do so they can get on with it;• Most of them do not understand MSDs and have very little experience in the range of issues that can impact on an individual. They have to rely on the individual's subjective story telling which may or may not reflect reality. This with time and budget restraints makes it very difficult;• These multiple problems that they now face is something that they have not be trained in and it is very difficult for them to manage the demands of patients. They often do not understand why people keep coming back when there seems to be very little wrong with them;• Something needs to be done differently.

8.2.1.2. Observations

General practitioners operate under pressure to assess, diagnose and either treat or arrange to treat a plethora of clinical and non-clinical issues. The time they have with their patient is limited and in many cases they will be unaware of the complex nature of the individual. They have to interpret what the individual is trying to describe which in itself is fraught with possible flaws from the manner in which the individual views their problem to the way in which the GP tries to interpret what they are saying and decipher within five minutes sufficient to potentially both diagnose and decide on treatment options.

A thematic analysis, as outlined by Braun & Clark (2006; 2013), identified a number of consistent themes that emerged over the three-year period including:

Insufficient time.

Relating to the circa seven minutes per patient per consultation in their practice:

Lack of time and understanding of MSDs.

Reference to their lack of specific training in this area of medicine unless they of course decide to engage in additional qualifications:

Limited training as a GP.

Again a reference to the generalist nature of their training which does not equip them for specialist areas:

Need easy access to a specialist e.g. a physiotherapist.

The ability to be able to refer to someone that they can trust who does have specific knowledge:

Demands from patients for treatment that may or may not be appropriate e.g. request for an MRI scan.

The changing expectations of patients which they find difficult to deal with and which they are not trained to handle:

Little knowledge of occupational health and ability to assess fitness for work.

Lack of knowledge and time to treat the other factors whether psychosocial, excess weight, nutrition or exercise.

This concurs with the work of Dame Carol Black and the expectations placed on GP's in relation to the introduction of the Fit Note with little understanding that GP's have little training to understand the issues individuals face within the workplace. The caveat is where the GP has undergone additional occupational health and/or job specific musculoskeletal training.

Whilst the potential new model to divert musculoskeletal referrals away from the GP to physiotherapists may allow more time for GPs to "treat more serious" conditions and allow patients more time it is unlikely to resolve some of the other issues identified as discussed below.

8.2.2. Physiotherapists

Of the physiotherapists interviewed or met with four were employed by the service provider and purported to be experienced in the BPSM. As such, it is believed that they should have a greater understanding of the multifactorial issues associated with MSDs.

8.2.2.1. Senior Physiotherapist 1

The following is a synopsis of two interviews and numerous conversations:

I have been involved in clinical practice for twenty years and about ten years ago. I wondered why the majority of people never achieved a 100% return to full fitness.

I had some defining moments – one was a lady with an OA hip and crying in pain. She was on a waiting list of between 18 months to 2 years – so quite common. GP was powerless. I therefore forgot about her but blow me one day she went passed me on her bike. I later found out that the Consultant had told her that her hip was not that bad and maybe it was the message that had allowed her to cope. This is when I got into the biopsychosocial model and became involved in functional rehabilitation.

Over the years I have done less for patients..... more interested in their stories.....what's going on in their lives outside of their pain with their job and their family. Learnt a lot about occupational factors such as: sick pay entitlements; their benefits; issues such as a disciplinary and other work factors; relationships and how much they enjoy their job.

Lorimer Mosley when he was suffering from cancer and after championing a different approach to MSDs for his whole career said that he felt that we are as far away as we ever were.

I am no longer surprised that physios are aware of the psychosocial issues but are not sure what to do with them – some of these are outside of their scope – and they think having conversations about mental health is a risk – and they worry about opening a can of worms.

When asked about who should provide this then, he commented:

Physio's are well placed to deliver this as they can give the patient reassurance and easily drift into a conversation.....

Having worked with a CBT therapist that provides support for chronic MSD patients she is reluctant to see the patient if the person has not been seen by a physiotherapist or other clinician as she does not understand the medical aspects.

Physiotherapists could manage a significant number of patients Management of the more resistant cases then it makes sense to bring in a CBT therapist.....

He said that clinicians do what they have been trained to do and moving forward it is ultimately about educating clinicians.

When asked about what patients understand about their condition he commented:

People remain in a model of receiving care and I think this is a criticism of our inability and lack of enthusiasm and if we look at cost then there is only a fraction spent on education.

When asked to comment on what he thought about lifestyle issues such as excess weight and exercise he responded:

I do not see many people who do not understand that being overweight, lack of exercise or drinking too much is not good for them.

There are discrepancies between what people say and what they do..... one patient thought they were exercising because they were putting washing into the washing machine..... They do not know what they are meant to do and therefore cannot engage.

He commented that he did not think that there was a link between an MSD and excess weight and that there was plenty of research to support this. He also said:

.....If we just get them to lose weight make bigger lifestyle changes then that feels like a far bigger task and a lot more difficult to make that shift.....the psychosocial factors drive behaviours.

When asked what we should do:

We need to have a more joined up strategy to help people eat better and exercise – we have a lot of carrot in the system.....maybe now we need to introduce some stick.

We need to lose the idea that everyone needs a health intervention.

A discussion then took place about the occupational aspects, which he felt were significant, and also whether we were becoming a nanny state. He displayed concern that from what he views in his work with the integrated health provider that he would not want his airline pilot or a truck driver on the motorway not to be fit to perform their duties. He said:

It is reasonable for people to take responsibility for their own health..... We cannot go on as we are.

When asked whether the situation was becoming unsustainable he said:

Definitely, in most NHS Trusts there is an ageing and less fit population who are demanding more and more.....

The conversation moved to a discussion on chronic patients and the benefits of the psychosocial model over the biomedical model. Also conversations regarding the variances in the socio-economic groups he treated in the NHS compared to what he assessed in the organisational space.

When asked about private healthcare plans he said:

We should keep people away from healthcare professionals, there is reasonable evidence that disability associated with the condition may be made worse by the health professionals.

A discussion took place on what he thought should be done about this including making people more aware of the issues that are associated with pain and the role of the employer in relation to normalisation.

Asked whether he thought if employees' expectations were too high:

The NHS and support from employers' can work against personal responsibility and self-help.

During the course of the remainder of the first interview and then subsequent conversations, the topics discussed included the culture of certain spectrums of the population those employed and the elderly. Issues with the younger generation and the inability to be as self-sufficient as earlier generations with expectations of entitlement a key factor. The comparison with the older generation who do not want to trouble the doctor or put a strain on the NHS was a marked contrast. The worry is as the younger generation ages then the demands on the NHS and employers will increase. His hope for the future was less investigations, less treatment and to help people live better lives.

8.2.2.2. Senior Physiotherapist 2

Having worked in a gym I have seen all sorts of people "boom and bust".

Gym based patients were mostly young and in their 20s-30s. Whereas my NHS patients that I see now are an average age of around 70 whilst in my private practice they are probably around 50.

The gym practice based patients were mostly office workers with postural issues and neck pain. Then at certain times of the year when they feel they want to get fit they take up a challenge such as running and this is when they got foot and ankle injuries.

People seem to not understand graded activity and older people seem to think that they can do what they did when they were 25 and then they wonder why they get injured. I used to see a lot of muscle strains from middle aged men trying to lift weight that was far too heavy for them or which they had not trained up to. Sometimes they simply try to compete with the younger guys and try and prove to themselves they can still do this.

People just don't understand their bodies and they don't look after themselves then suddenly they think by going to a gym or doing a bit of exercise that they can lose weight and solve their problems. They go from a sedentary lifestyle to increasing their training very quickly, then get overuse injuries, and may of course give up because of this. The shoulder injuries would also come from poor technique, especially bench pressing and result in a rotator cuff injury.

When asked about postural issues she mentioned:

People may look a bit abnormal but this does not mean a person will have pain.

When asked about identifying and treating the psychosocial issue she responded:

The problem is that some people firmly believe they have a specific injury and may have an idea of the cause whilst others have no idea. My NHS patients have a fixation on damage beliefs. I do not like it when they go to a practitioner who tells them that something is out of balance, which may not be the case. The individual can focus on what the practitioner has said and not really understand what is meant by that. The other problem is what they read in social media and patients often have too many opinions.

Many patients do not trust their GP.

When asked why she felt this was the case she responded:

Many GPs are reluctant to diagnose. MSDs are not in their area of expertise so they leave it to us.

People are fixated on knowing what is going on and private patients are worse: I had one patient who had only had back pain for two days and then was demanding an MRI scan and believed they needed surgery. They Google their symptoms and self-diagnose. They cannot understand how we can assess and treat without a diagnostic tool, what they do not realise is that most of the tests are unreliable in some form anyway.

Practitioners often feel obliged to give patients what they want and for some this helps generate extra money especially when they need to pay the mortgage. Some are unwilling to discharge whilst others are driven by commercial employers.

We see women where some do understand that their weight is impacting on their knee pain whilst others that have always been overweight and are just starting to experience pain do not connect the two. Men on the other hand do not see the connection.

People find it difficult to lose weight and say they have tried and tried – this is especially true in the over 50s. So they often accept that there is nothing that they can do about it. Also some people really do not like exercise, they do not like the gym and they do not like anything else. I have tried to encourage them and to get them to find something they do like but they don't even try to find out.

When asked then about diet:

People do not really understand nutrition. The media does not help. People do not realise the need to burn off the food that is in that wrapper.

On psychosocial factors:

I feel I am OK at identifying certainly the Yellow Flags and to some degree the Blue and Black but I am not sure it is our place as physiotherapists to treat those issues.

I find using the STaRT Back tool useful to assess the issues but treating them is a different matter:

I think this is really the role of the CBT practitioner;

Personally I feel quite uncomfortable going into areas with a patient that I do not really understand;

The patients expect to be treated and this to be hands on;

They do not understand when this does not happen.

NHS patients are more forgiving ... private patients expect something better.

If they think there is something seriously wrong, then they want it treating immediately. Many are just the worried well and need reassurance.

In patients who have a financial motive I am always convinced in 90% of the cases they do not want to get better but then some are genuinely seriously ill.

When asked to comment on her training:

The training was old fashioned and it did not cover everything – it was all about pain and pain management.

Much of what we were taught on exercise is out of date. We tend to keep up to date on exercise by Twitter and blogging.

Maybe there needs to be greater connectivity between practitioners so we know what we can really do to help a patient.

8.2.2.3. Senior Physiotherapist 3 – involved in functional rehabilitation

I trained as a physiotherapist a lot later than the norm. I did think during my training that what they were teaching seemed a bit archaic and certainly the main reference book provided by the University was more than twenty years old but the pictures seemed considerably older.

Having been on a holistic practitioner course to teach me about corrective exercise, exercise and nutrition it has totally changed the way I practice.

Physiotherapists have no idea how little they know about exercise. They are only trained in the basics and then use something like Physio tools to use to support them prescribe the exercises. Physios really need to understand more.

Psychosocial factors are key to understanding how best to treat someone and whether they are going to manage their problems in the longer term.

I have had two patients say some amazing thing to me recently having attended the FRP.

One said:

“I now feel human again having felt like an alien before”

The other said:

“I have been in pain for forty years and I have had every form of treatment for my back pain, now it is like a light bulb being turned on and I feel like a new man and I want to tell everyone about this”

This practitioner then commented on his recent experience in dealing with other physiotherapists on a major change programme being implemented by the NHS:

Having been involved with a number of physiotherapists recently as part of the changes the NHS want to make then it is clear that a large number of them do not want to change. Their attitudes are very negative they say that you cannot triage someone over the phone yet I have been doing it for years. They say that you cannot give self-help as patients do not understand, yet our figures say different. Also they just want to keep treating rather than helping people help themselves – they seem to think that the fact that they have always practised in a certain manner and therefore that must be the way for future.

8.2.2.4. Physiotherapist 4 (former case manager)

The psychosocial issues are just so fascinating – people just have no idea – I find helping people identify these issues very rewarding.

I am consistently learning something new every day about patients and I want to continue learning and take more courses.

Having been a case manager I can see all of the different aspects that affect someone’s attitudes and beliefs towards life and to work.

Some people have very fixed beliefs that are totally wrong and if you can help them understand and benefit from helping them understand more about the mind and their bodies then it is fantastic but some you just cannot budge and this is so frustrating because you cannot help them because they will not help themselves.

8.2.2.5. Senior physiotherapist 5

There is so much more to people’s pain than we are taught or that a lot of physiotherapists understand.

Practitioners can put ideas into patient's heads and not realise the damage they are doing.

8.2.2.6. Senior physiotherapist managing nationwide network of physiotherapists

Physiotherapists understand exercise, it is what we do. The new NICE guidelines (2016) are very little different to what they were before. They prescribe exercise and this means that physiotherapy is the most appropriate treatment.

Good healthcare is prompt healthcare. Getting people to early interventions with physiotherapy or arranging an MRI scan or referral to a consultant is what is good.

Our physiotherapists understand the biopsychosocial approach. We train them in CBT.

8.2.2.7. University placement manager - physiotherapy

The problem with the training programme provided by all of the local universities is that they focus on the medical model and this is now so out dated.

The training does not incorporate anything really on the biopsychosocial model but certainly nothing on work, or excess weight or activity.

What they are taught on exercise is very basic and in reality the training really does not equip them to deal with when they are in the real world with patients.

It has to change.

8.2.2.8. Observations

The expectation of a physiotherapist is that they can assess and treat individuals with MSDs. If the individual is not appropriate for physiotherapy or where physiotherapy has failed then the practitioner is expected to refer to the most appropriate clinician which is often an orthopaedic surgeon and, in some cases, an orthopaedic physician, although the latter are a rare commodity.

It is evident from the interviews and the discourse analysis from less formal conversations that a number of recurrent themes arise:

Box 11: Summary of themes

Physiotherapy observations
<ul style="list-style-type: none">• Physiotherapy training appears limited to the medical model;• It does not teach how to assess and manage the psychosocial issues which some feel reluctant to embrace;• Practitioners state that they understand the psychosocial model but in practice their knowledge appears limited to assessing a few Yellow Flags;• Basic CBT training will not address the problem as it does not address the complexity;• Practitioners who do understand the psychosocial aspects may lose sight of the biomechanical and other causative or contributory factors.

Physiotherapy training encompasses a basic understanding of exercise when compared to a sports medicine or corrective exercise practitioner. Understanding of occupational factors are often limited to a general understanding rather than a risk assessment based model. Knowledge of the implication of other personal risks are not within their training. Yet patient and employer expectation may be somewhat different.

The new direct referral model being adopted by many CCGs throughout the UK (CSP, 2016) places additional pressure on physiotherapists to accommodate 20-30% of the GP referrals. Although physiotherapists are trained to assess, diagnose and treat MSDs it is evident that their knowledge of how to address the emerging issues need to be addressed.

8.2.3. Musculoskeletal specialists

This group of clinical specialists includes: Orthopaedic Surgeons; Orthopaedic Physicians; and Sports and Exercise Physicians.

8.2.3.1. Orthopaedic surgeon (knee and hip specialist)

If I could work with someone who could prehab patients prior to surgery it would be amazing. Most patients I see are deconditioned and therefore they are less likely to have a successful outcome from the surgery. Helping individuals to get fit before the surgery would improve the outcomes no end.

8.2.3.2. Senior orthopaedic surgeon (knee and hip specialist)

We need a tailored healthcare approach. Individuals are so different. There are a number of conservative options for people but they sometimes do not want to know.

8.2.3.3. Consultant orthopaedic surgeon

I feel I have failed if I have to perform surgery. Years ago I used to operate on most – today I operate on a few. I had to see people saying that they cannot do this and cannot do that when they have no idea what musculoskeletal ill health really is. Just look at a cancer patient who really does have a crumbling spine.

8.2.3.4. Senior orthopaedic physician

It is all about the psychosocial aspects.

Corrective exercise, muscle imbalances and all that jazz is a load of mumbo jumbo and there is no evidence for it.

The only issue is the psychosocial aspects and knowing how to identify these and any elephants in the room.

If you really believed in the psychosocial aspects, you would not refer to physiotherapy.

8.2.3.5. Consultant musculoskeletal specialist (private sector only London practice)

The patients I see are private patients, most of whom have health insurance. They tend to know what they want when they see me. They demand a certain treatment and if I do not give it to them then they complain.

Often I tend to give people what they want rather than what they need.

The cover that they have with their insurance company is their right – yet the insurance company try to stop people from claiming and they do not know how they ruin people's lives.

Many people I see have issues at work and there are a lot of psychosocial problems.

When asked about weight:

I don't think weight is an issue. I do not see many people that are overweight really and I don't think it really makes much difference. Diet is also so very difficult and people are confused.

Activity on the other hand is key and so many people are inactive – part of the problems is they say that they do not have the time. I don't think they realise the importance of exercise.

When asked about his training:

Most of what I do now is based on experience and especially relating to the biopsychosocial model.

The problem is you can set yourself up as a musculoskeletal specialist and nobody cares about your training – you can call yourself what you want.

When asked about exercise specific training:

I have not done anything since I first trained – so yes you could say I am out of date but I know the basics.

GPs do not really know what they are doing other than those that take the extra training through the British Institute of Musculoskeletal Medicine (BIMM) or similar to find out more. I am not sure that physiotherapists are much better.

8.2.3.6. German musculoskeletal specialist (private sector only) working in UK

The problem with people in this country they take no responsibility for their own health.

They also do not respect doctors anymore – at one time we used to be respected members of the community but now people will get aggressive with us, do not respect what we say and so you just end up giving them what they want.

It is not right, giving them unnecessary, or inappropriate treatment but what do you do? They will complain about you to management and then we get kicked – we cannot win.

I have actually had enough here and I am going to move to Switzerland where I hope it will be better.

8.2.3.7. Observations

These practitioners practice in a specialist field of orthopaedics. These are physicians, (or refer to themselves as musculoskeletal specialists) who use a range of skills to assess and treat patients with a variety of different techniques (e.g. injections).

The patients' expectations of these individuals are such that (having by this time likely to have exhausted other conservative options) they may believe that they have a more serious condition and requiring "specialist" intervention. The problem that arises is that the practitioner may not find it easy to identify exactly what is wrong and what is causing the pain or the dysfunction. The patient may believe that the practitioner needs to use a diagnostic tool to assess their condition without understanding the flaws associated with the use of technology as outlined in chapter 2.

The patient at this point may have been in pain for some time and their condition likely to be impacting on work and/or social life. They may be emotionally aroused, angry and

frustrated and may be unhappy if they do not get what they want, not realising that what they want may not give them what they need. Access to the standard information such as that published by Arthritis Research (which they interpret from a lay perspective) is unlikely to help them understand the range of possible factors and that the solution may be guided self-help, which an experienced practitioner can support.

Two issues therefore arise:

1. The practitioner may not have the necessary skills to assess and address the range of issues that may be impacting the individual physically and psychologically;
2. The individual either, attitudinally or from a belief perspective may have an expectation of an intervention and as such may have difficulty accepting one, which is self-help and responsibility.

In other forms of social conflict of interpretivism the solution may be to mediate any difference of opinion but in the provision of clinical care the potential may not arise unless a case manager or other independent practitioner, is involved that can attempt to explain why such an approach may be of benefit to the individual.

8.2.4. Non-clinical practitioners

These individuals tend not to have any clinical qualifications and more aligned to sports and exercise. The scope of their training is very dependent on the type of qualifications they have undertaken. Their practise varies from assessing and treating sports injuries to assessing and treating common MSDs and they may also work alongside clinicians. It was envisaged that following the London Olympics more people would engage in exercise (Prest & Partridge, 2010). and that this would lead to more injuries. The new role, Consultant in Sport and Exercise Medicine, (Faculty of Sport and Exercise Medicine, 2009) was introduced in the NHS to address such problems. The number of practitioners with this qualification is currently quite small (around one hundred) but the role does not appear to have evolved in a manner that bridges the clinical and non-clinical interface highlighted in this thesis. Yet their skills have a place in the management of MSDs (Clark & Lucett, 2011; Chek, 2011).

8.2.4.1. Corrective exercise and holistic practitioner (involved in clinical and non-clinical practice)

People get musculoskeletal problems because they are deconditioned and they are not functionally fit. They do not understand how their bodies are designed to move and if you do not use it you lose it!!

There are certain people that get problems due to over compensation and poor movement patterns, lack of tissue integrity connection with activity and hydration.

The medical model is not suitable for the large majority of cases instead, many people could benefit from exercise prescription and being mindful of their movement and how they use their body.

People do not want to take ownership of their body and their health preferring to “be fixed”. They externalise rather than internalise and do not reflect on what the root cause is.

Medical practitioners in general need to be more open-minded and need to push back to patients and encourage them to self-manage, doctors need to help people lose weight, and get more active.

I don't think doctors understand patients as well as they think they do – they look at things too clinically – they want a maths equation – a linear relationship – but it does not work like that - it is dynamic.

Practitioners jump on bandwagons with fad terms and fad treatments. The psychosocial movement appears to have completely ignored the biomechanical model. The mind and body seamlessly interact with each other and suggesting it is just in someone's head is not the answer – it does not help.

Practitioners do not understand the connectivity of the body and mind as a whole not as component parts that we can somehow remove and fix.

8.2.4.2. Corrective exercise and holistic practitioner coach (with published articles)

Practitioners are responsible in the manner in which they communicate with their patients. It is important that the practitioner really takes an interest in what their patient is saying. Telling that it is all in their head or some other message, which they cannot understand because their pain is real to them, will do nothing to help them.

A practitioner needs to present in a confident but not arrogant manner any negative influence can affect the patient and deliver unintended consequences. Explanation of how the patient may benefit and how they can be empowered to help themselves is more likely to create a positive shift than suggesting that they need to do something when they cannot understand why.

If we are to help our patients, we need to help people understand that there is not some magic bullet we can prescribe and that often there is no single causation – people are complex and we need to recognise this.

8.2.4.3. Observations

Although only two practitioners were interviewed it is understood that the teaching of Paul Chek, Charles Poliquin and the National Association of Sports Medicine (NASM) teach a

more holistic approach albeit that each approach varies somewhat the “holistic” principles remain.

The skill is non-clinical approach and such practitioners often consulted when the medical model has been applied and failed. In principle, they appear to follow a biomechanical model more aligned to sports medicine for the physical aspects and to some degree osteopathy but in addition consider aspects such as: sleep quality; nutrition; hormonal balance, emotions and some psychosocial elements.

This *holistic* approach is about supporting the individual to self-manage short-term issues and develop their understanding of functionality, biology, and physiology for the longer term (Walden, 2015a). It considers a broader range of possible causative and contributory factors to engage an individual in their own recovery and take back control of their own health (Walden, 2015b, 2017) a concept that may be difficult to accept for someone who believes that they need a medical solution.

Whilst practitioners consider psychological, nutritional and emotional factors, their training does not normally prepare them for the broader psychosocial or occupational factors outlined in this thesis.

The physiotherapist who undertook further training in this type of assessment and treatment model reported that he had totally changed the way in which he practiced and this has led to not only a very different approach but also has impacted on his outcomes.

8.2.5. Other managers of musculoskeletal health

These individuals are involved in the delivery of both primary and secondary musculoskeletal medicine and the management of quality and clinical and non-clinical staff.

8.2.5.1. Senior manager CCG

This individual is a senior manager responsible for purchasing healthcare delivery within the county and involved in reorganising the way in which musculoskeletal medicine is provided within the NHS across the various areas within the shire.

We need to take a new approach to the assessment and management of MSDs. We would like to introduce a telephone triage service (as recommended by the NHS) but our physiotherapists say it cannot be done. We also need to work to a model of one initial assessment to two follow up treatments for physiotherapy but our practitioners say that it does not give them time to treat the patient.

We suffer with patients demanding treatment such as MRI scans and the GPs have responded and arranged scans outside of the clinical pathway.

We are witnessing unnecessary diagnostics and inappropriate treatments and this has to stop, as it is not good for the patients.

We need to move to more self-help and use the findings from the latest research, which recommends more exercise, and more psychosocial management but our clinicians do not understand how. The current medical model is out of date and unsustainable.

8.2.5.2. Senior manager – Health and Social Care Trust (HSCT)

We need to deliver what the Commissioners have requested but we do not have the skills to do this. Our physiotherapists appear reluctant to change. This is an exciting opportunity to start to grasp the real issues and help people take more responsibility for their own health yet the clinicians cannot envisage how this can work.

8.2.5.3. Observations

The media and patients may perceive that what the CCG and HSCT wish to adopt, as recommended by the CSP and NHS, as a cost cutting exercise. Conversations with other managers involved in this change process reinforced the difficulty in trying to change the ways of practitioners. The CCG and the HSCT believe that the future is about helping people to help themselves not just in relation to MSDs but many other conditions but frustratingly have to accept that this will take time.

8.3. Conclusion

Although the various practitioners have different roles in the assessment and management of MSDs there were some common themes that arose across all practitioners. Table 28 (page 204) summarises the key observations from the different interactions with the individuals involved in this research. It is accepted that the majority of these practitioners are those that to some degree have been exposed to the BPSM and issues that arise within the workplace and the provision of benefits via the individual's employer. If this study were extended to a far broader range of practitioners, it is hypothesised that in general musculoskeletal practitioners do not consider the relevance or otherwise of the covariates outlined in this thesis and how these may impact the incidence or severity of a person's MSD.

Table 28: A summary of the main themes identified from the practitioners' perspective

Type of Practitioner	Themes
Case Managers	<ul style="list-style-type: none"> • Find the individuals with whom they have to deal with mostly ignorant of the broader underlying risks. • Have to manage expectations of what an individual may want as opposed to what they need. • Find dealing with clinicians part of the problem due to the language used and their focus on trying to treat a symptom when this may not be the issue. Not surprised that patients need to keep going back. • Have difficulty understanding that clinicians do not understand the range of factors that affect a person's life and the cause and/or maintenance of their illness.
Physiotherapists	<ul style="list-style-type: none"> • Training appears limited to the medical model. • Training does not provide sufficient education on: exercise, weight management or the biopsychosocial factors. • Lack of confidence in the psychosocial aspects means physiotherapists have difficulty in both assessing and treating patients where these factors are relevant. • Practitioners who embrace the psychosocial factors may fail to maintain knowledge of biological and biomechanical issues. • Training also limited in occupational factors. • Insular in their view probably based on their training. • Those that extended their training appeared to embrace a more "holistic" approach.
Musculoskeletal Specialists (clinical)	<ul style="list-style-type: none"> • Ambiguity around skills that "qualify" an individual to be termed a musculoskeletal specialist and could be clinical or non-clinical. • Those who specialised in the biopsychosocial approach tended to combine this with their medical knowledge but did not really expand on anything else.
Musculoskeletal Specialists (non-clinical)	<ul style="list-style-type: none"> • Appear to have a broader holistic view from those interviewed and also additional knowledge of their work.
Surgeons	<ul style="list-style-type: none"> • Three orthopaedic surgeons that participated in this research were open to change and felt individuals needed help. It is accepted that these surgeons are directly involved in recommending such changes and their opinions biased to this approach hence these findings not necessarily representative.
CCG	<ul style="list-style-type: none"> • The local group are looking to make significant changes and it is believed that their views are not isolated to within this county. • Believe that we have to help people take personal responsibility.
Health and Social Care Trust	<ul style="list-style-type: none"> • Need to make a change due to budget pressures but held back by understanding and willingness to change of their physiotherapists. • Are excited about the opportunity to help people take back control and manage the real issues that not only affect musculoskeletal health but also a wide range of other health problems that they have to manage.
University	<ul style="list-style-type: none"> • Individual conversation with someone who still is a practising physiotherapist was very concerned about the ongoing training of physiotherapists being limited to the medical model.

PART 3 – Discussion, Limitations and Recommendations

Chapter 9

Discussion

9. Introduction and summary of contribution

This chapter considers the information available to organisations about the incidence and severity of MSDs in both academic and grey literature and compares the data with the findings identified from the quantitative and qualitative studies outlined in chapters 5, 6, 7 and 8. It also provides a summary of the contribution of the thesis to the prevention and management of MSDs and potentially other health conditions. It focuses on what has emerged from the convergence of the data and provides some early insights from ongoing action research.

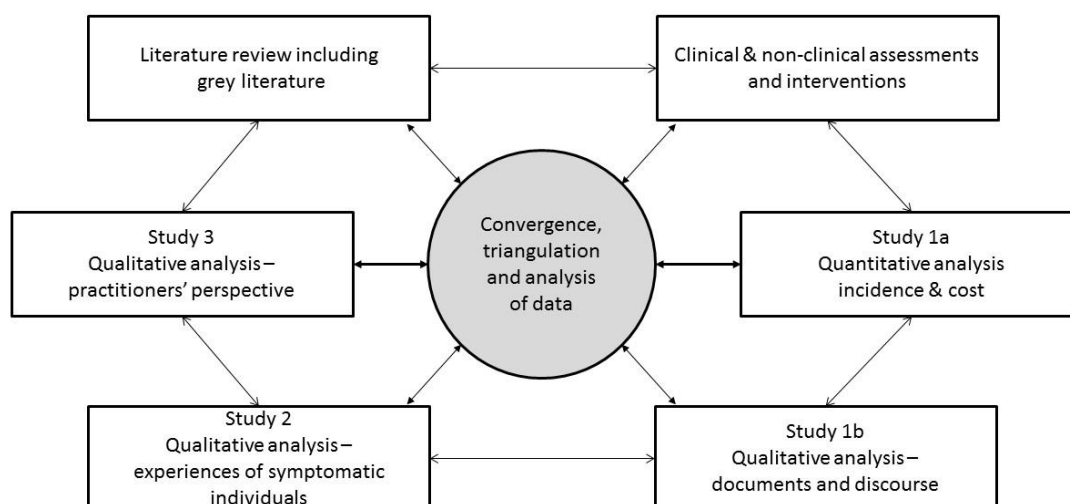


Figure 10: Explanatory sequential mixed methods research design – convergence of data

Each study contributed in its own right as summarised in Table 29 and the literature and data reviewed at each stage to enrich the overall contribution of this thesis.

The findings from the early insights of the action research mentioned in chapter 5 is outlined in 9.1 and a more detailed discussion on each of the main topics provided in 9.3 to 9.7 below.

Table 29: The contribution to research from the convergence of data from the four studies and the literature reviewed

Study number	Individual study contribution	Integrated contribution following data convergence
Study 1a		
	Accessed range of organisational data not normally available or published;	Provided evidence that organisations should; define their data parameters to allow comparison across benefits; consider integration of their data to aid development of safety, health and wellbeing strategies;
	Identified scale of prevalence not previously known to the participating organisations and the incidence of excess weight and inactivity of individuals with MSDs;	Quantified the prevalence of key personal risk factors and the potential need for these issues to be addressed as part of the risk assessment process, health benefit provision and wellbeing strategy;
	Identified “gaps” in industry in relation to the consideration of these issues when compared to academic and grey literature;	Provided the insight to further explore quantitative and qualitative data from clinical and non-clinical evidence and individual narrative (patients and practitioners) and management to review how the occupational and personal risks and currently and develop improvements to reduce the risk of harm and improve outcomes for employees and the business;
	Identified that wellbeing provision focuses on weight, cardiac, diabetes etc. but not on MSD’s even though these are the single most significant work place factor;	Data used to further develop data capture and lay foundations for ongoing interrogation of data on age, gender, psychosocial and personal risks to tailor more relevant preventative strategies (wellbeing), control measures (safety) and appropriate interventions (health);
	Identified significant research and potential practice gaps including a focus on resolving causation of pain whilst ignoring factors that may escalate the rate of degeneration and lead to more complex longer term problems.	A range of possible causative and contributory risk factors can impact individuals in different ways and to different degrees of severity suggesting that current practice models are not addressing the problem and that this is likely to be true for a range of other ill health problems. These findings suggest that there are multiple possible underlying causation and contributory risk factors that need to be understood and that those discussed or touched upon within this thesis are not exhaustive and as such further research needed to consider the whole person.

Table 29 continued: The contribution to research from the convergence of data from the four studies and the literature reviewed

Study number	Individual study contribution	Integrated contribution following data convergence
Study 1b		
	Identified what patients say to their employers, case managers and clinicians and what clinicians do or do not identify;	Ability to compare perception and expectations compared to actual practice of clinicians, occupational health practitioners, HR and line managers;
	Provided further evidence of the potential range of personal risk factors that may not be recognised by individuals and are potentially often ignored in clinical practice including those that have been evidenced in literature e.g. exercise and psychosocial factors;	The identification that clinicians and other interested parties are not addressing the multifactorial nature of MSDs probably due to evidence that suggests that these factors are not associated directly with pain or lack of training and understanding of how to <i>treat</i> these issues. Whilst pain is important to the patient it is a symptom which may be caused by multiple issues. Evidence has shown that apparent clinical causation e.g. disc degeneration or disc bulge may also not be related to pain. Ignoring risk factors that can affect a person's musculoskeletal and general health is missing an opportunity to help individuals understand that weight, activity, nutrition and psychosocial factors are important for long term health and wellbeing and that together (with other factors) are health risks that can present in a number of different ways including a reduction in musculoskeletal function over time which could be prevented;
	Outlined the complexity and simplicity of cases and that the issues are that: most clinicians have only a basic understanding of the biomechanical factors and that the biomedical model should not be confused with the biomechanical model; this is also relevant in relation to the biopsychosocial issues; models are dismissed without a true understanding of their possibilities; there are considerable inconsistencies between research, practice and understanding of the need to address the considerable variances in demands that practitioners now face from patients.	A need to be: less reliant on the medical model; less focused on pain in isolation or the need to attribute this to a singular clinical causation; understand the limitations of the medical model and the level of training and experience of clinicians in aspects such as biomechanics rather than dismiss this as a discipline which is not relevant (often due to a limited understanding of these factors in relation to pain) without understanding what a skilled practitioner can offer in relation to addressing dysfunction that may be relevant in the longer term; truly understand the biopsychosocial model in its broadest sense and not an often limited perspective; consider knowledge from a range of other clinical and non-clinical disciplines; address the individual differences (rather than managing patients via an outdated standard care pathway); educate patients and the public how they can take greater control of their own health and the rewards this can offer and bridge the significant gap between academic research, clinical understanding and practice as further outlined in chapter 10.

Table 29 continued: The contribution to research from the convergence of data from the four studies and the literature reviewed

Study number	Individual study contribution	Integrated contribution following data convergence
Study 2		
	This study enriched the findings from study 1b and provided information directly on patient experiences and perspectives. It identified that activity, weight, work and psychosocial factors were all relevant factors but that these were not exhaustive in these participants;	That customer (patient) experiences and expectations do not appear to be listened to and if we fail to consider the whole person by focusing on a single condition e.g. low back pain without understanding the person and what is impacting or affecting their health, including their musculoskeletal health, really means we miss that opportunity to not only treat current symptoms but to prevent future ill health;
Study 3		
	That patients have increasingly high expectations of what they want rather than what they need and that this is driving demand;	That changes in society is contributing to incidence and unnecessary interventions (due to inaccurate beliefs), which combined with the lack of training of clinicians means at worst that potentially individuals could be caused harm and at best employers and the Department of Health are incurring unnecessary cost. Provision of benefits such as private healthcare appears to exacerbate this problem due to the inference that this benefit is provided because prompt treatment is their right and is necessary, ignoring that this may not always be clinically appropriate and that the private sector provides a higher quality of care than the NHS. Educating the public, patients and practitioners should improve understanding, and help change behaviour.
	Clinicians are not trained in managing this demand, feel less valued and need training to address the changing societal needs.	That employers can help by driving change through wellbeing, health and safety and providing benefits that allow access to appropriate interventions which go beyond the medical model and may encourage practitioners from different disciplines to learn from each other whilst educating their employees on causation, contribution and how many problems can be managed with guided self-help rather than clinical interventions.

Table 29 continued: The contribution to research from the convergence of data from the four studies and the literature reviewed

Convergence		
	<p>Each study informed the next and the data triangulated across the four studies combined with a regular refresh of the academic and grey literature to cross-check any changes in accuracy or meaning.</p>	<p>A summary of the key findings included:</p> <ul style="list-style-type: none"> • Underlying causation and contributory risks are multifactorial and this thesis has only touched on some possibilities and whilst more exist others may also be unknown; • Access to data outlining the range of individual variances identified the need to assess the range of risks and prioritise these in a tailored manner; • Individuals (patients and the general public) could benefit from understanding the multiple risks and how they can self-manage their personal risks to address not only their MSD but health risks using non-clinical interventions to limit the need to access clinical solutions which may or may not address their specific problem/s; • Knowledge from multiple disciplines (clinical and non-clinical) needs to be integrated to develop a range of training programmes for a range of practitioners and/or integrate practice; • The need to focus on the whole person to improve patient outcomes, reduce risk, unnecessary demands and cost. <p>Failure to change will mean that prevalence and incidence is likely to increase, patients will continue to suffer and the Government, insurance companies and employers will have to face an ever increasing cost burden.</p>

9.1. Action research outcomes to date and ongoing developments

Following the introduction of the methodology discussed in chapter 5 (outlined in more detail in chapter 10), the following results have been validated after the first fifteen months:

- A reduction in overall sickness absence from 6.5% to 5.0% in Company D;
- A 13% reduction in musculoskeletal incidence and a 48% reduction in the number of days lost for MSDs in the winter months (comparing October to December 2016 to the same period 2017) which for this organisation is reported as being consistently high due to the volume of work (e.g. problems with heating), increase in working hours and more difficult working conditions (dark and/or cold when travelling to and from customers);
- A significant reduction in the cost of sickness absence and the cost of treatment provided on the healthcare plan;
- Improvements in the software and input for Company B and D to allow access to more detailed data, improve analysis and track outcomes;
- The ability to identify individuals who suffer from repeat musculoskeletal episodes and the increase in incidence in individuals who are overweight and or obese and inactive and the variation by job type.

From the above information three further studies have been agreed:

1. The introduction of a functional movement screen into the wellbeing programme where a team of 15 physiologists have been trained in how to conduct such as screen with the ability to refer to corrective exercise specialists where any problems are identified. These practitioners will also involve physiotherapists where potential clinical issues are recognised. The objective data will be matched and compared with the subjective individual reports to allow a greater understanding of individual belief, clinical and non-clinical diagnosis;
2. Those individuals who are suffering from repeat episodes which may impact on their ability to work or affect their quality of life are to be offered physical and psychosocial interventions with the aim of reducing their future risks. The prevalence of repeat episodes is greater in roles that require some form of manual handling, driving and shift work due to the difficulties in such individuals being able to perform their roles safely. In this particular category 830 individuals have been

identified and these will be assessed for suitability of a functional rehabilitation programme to address physical, psychological and social causation and maintenance factors. The programme will be provided over 4 weeks and then will be followed up at 6, 12, 24 and 48 weeks. This study will allow the capture of significant objective data which will be compared to the subjective findings;

3. The potential for smart work wear to be issued which will include intel chips in the trousers and polo shirts to measure: gait; joint angles; posture; time in a position; pressure points (e.g. kneeling) and more as the development of the technology allows. This again will allow comparison between subjective reporting and reality to improve safety compliance and early identification of occupational and personal risks with the aim of reducing such risks to prevent the incidence and or severity of an ill health episode or injury. This project may take at least one year to develop the clothing.

9.2. Background information

The initial research hypotheses were based on the author's experience of working in the healthcare industry and over thirty years of direct involvement with organisations and their quest to reduce musculoskeletal ill health and injury. In particular, the aim of the research was to clarify:

1. The variances between published information and the suggestion of occupational causation;
2. The focus on treating apparent clinical issues;
3. The potential of underlying personal risk factors, and whether these are considered by symptomatic individuals or by practitioners as a possible causative or contributory factor.

The purpose of this thesis is to outline the prevalence and cost (financial and morale) of MSDs in the workplace, the effectiveness of current intervention strategies and whether these need to be reviewed for the benefit of employees and their employers

9.3. Theoretical considerations

This discussion highlights the complexity of MSDs in the workplace, complexity at the organisational level, complexity at the individual level and the complexity for practitioners. From a theoretical perspective, lack of specificity may be acceptable to avoid criticism by critical theorists (Kincheloe, et al., 2013) but at a practical level, this is not. The data has

captured issues of interpretivism at several levels including issues within research that can underpin clinical practice. The interpretation of language between people, whether written or verbal, and how this can drive behaviour, should be a construct tangible and consistent with understanding psychology understood by management, employees and any associated service providers.

Bricolage as a methodology that embraces other theoretical frameworks has allowed multiple perspectives (Kincheloe, et al., 2013) to be considered and reflect the complex nature of organisations and the individuals who work within them. As people, *we do not know what we do not know* and if we accept that this can limit our understanding of our world and the people within the world, we may comprehend more. As individuals, we are each unique (Cooper, 2002) and should consider strategies to embrace these differences rather than to standardise people into restrictive categories.

This approach has encompassed the interfaces that individuals have within their family and social life, with work, the benefits provided by work, and the provision of clinical interventions whether NHS or private. The *do it yourself* concept of a *bricoleur* could easily translate to a guided self-help model of musculoskeletal health and repair, with the prospect of only needing a *specialist carpenter* (orthopaedic surgeon) on limited occasions when the *job* (need for a clinical solution) is too *complex* (beyond the scope of self-help or a non-clinical solution).

9.4. The literature – scope, quality and definitions

An integral part of this research was to review the published information in academic literature and public materials accessible to organisations and their employees using a Boolean search criteria of the various musculoskeletal terms e.g. low back pain and then with each of the possible covariates e.g. inactivity.

9.4.1. Public health and legislation related literature

Information available to employers and individuals appears counterproductive to musculoskeletal health. Health and safety materials suggest that work can be harmful and recommends avoidance behaviours at work, which could lead to beliefs that activities that include manual handling are likely to cause an MSD whether the activity takes place in or outside of work. Legislation such as the Disability Discrimination Act (now incorporated into the Equality Act 2010), intended to protect individuals with disabilities from discrimination, appears to have led to an unintended consequence of employers moving away from assessing fitness for purpose in general. This development has meant that

employers could inadvertently cause harm to an individual, in ignorance of whether they are physically or psychologically suited for the role. Failure to assess on-employment misses an opportunity to help employees understand the occupational risks and how to eliminate or reduce any impact these may have on their health. Omission in legislation of any reference to the need for employees to take responsibility for their personal risks could suggest that such risks are not relevant and potentially mislead individuals.

The Government needs to consider carefully the messaging inherent within legislation and associated guidance to employers and employees and focus on how individuals can help build and maintain a healthy musculoskeletal system as opposed to encouraging practices which may be potentially detrimental to both physical and psychological health.

9.4.2. Clinical literature

Clinical literature underpins the assessment and management of MSDs and drives clinical practice across primary and secondary care, but the volume means that clinicians would need to read over thirty articles per day, every day, to keep abreast of the research a problem which organisations such as Cochrane try to ameliorate for clinicians (Santesso, et al., 2006).

A further issue is that the focus on a specific linear relationship between a condition (e.g. low back pain) and the presence of another phenomenon or the success or otherwise of a specific procedure. Articles that considered the complexity of factors that may be affecting the person at the time of presentation of an MSD, the possible underlying cause and or contributory risk, which may affect the person longer term and how these are treated, are rare.

Over time, NICE in the UK and other similar organisations across the world evaluate the literature and provide recommendations for the management of certain conditions, the scale means that the process for a single problem can span many years and hence, in the meantime, patients may receive unnecessary or inappropriate diagnostics and procedures (Malhotra, et al., 2015).

Research which considered one or more of the covariates was evident in clinical and sports medicine journals, but with little integration of the findings across the disciplines. Lack of common definitions and how the interpretation of the data may affect conclusions drawn is discussed below (page 215).

9.4.2.1. Example of issues with definitions

One of the fundamental issues associated with research articles relating to musculoskeletal health or ill health is that associated with defining the terms used (Patel, Friede, Froud, Evans & Underwood, 2013) which without identification and clarification can result in a fundamentally weak conclusion.

An example of the potential flaws within two systematic literature reviews are summarised in Table 30. The latter by Smith, Littlewood and May (2014) is an update of the former, by May and Johnson (2008) and interpreted by physiotherapists participating in this research, to be the reason why they should no longer prescribe stabilisation exercises for low back pain. These studies or reviews utilised the evidence database criteria (PEDro) founded by the Australian Physiotherapy Association, (1999). If the AMSTAR quality criteria pertinent to assessing the quality of systematic reviews (Shea, et al., 2007;) were used then the score for this article would be 7/11, suggesting that this review would be regarded as reasonable quality. Neither PEDro nor AMSTAR consider the range of issues outlined below and that may question the quality of the article.

Table 30: Information not considered in two systematic reviews of stabilisation exercises for low back pain

Topic	Comment – Not apparently considered
No definition of what constitutes a <i>stabilisation exercise</i> was referenced and no standard set or framework used when reviewing the studies.	<ul style="list-style-type: none">• Use of language especially within a single profession can assume that a term is understood;• Consistency across practitioners of exactly what is inherent within this term;• Type, frequency, intensity and duration of the various exercises;• Exercise professionals may have a different interpretation of what exercises would or should be included under this term, how they are “prescribed” based on age, gender and fitness, when they are used and be more proficient in delivery.
An understanding of whether the individual performed the exercises correctly.	<ul style="list-style-type: none">• Observation of the individual performing the exercises;• Impact this could have on outcomes.
Objective data to suggest that the individuals did perform the exercises.	<ul style="list-style-type: none">• Compliance of individuals (frequency and intensity);• Use of technology.

Table 30 continued: Information not considered in two systematic reviews of stabilisation exercises for low back pain

Topic	Comment – Not apparently considered
The suggestion that these exercises were prescribed at acute onset of back pain.	<ul style="list-style-type: none"> • Not an appropriate time to prescribe such exercises; • Symptomatic individuals unlikely to comply at such time; • Should be part of an overall exercise regime and not a symptom management tool.
The qualifications and experience of the physiotherapists that prescribed the exercises.	<ul style="list-style-type: none"> • Competency of the practitioner; • How they instruct the patient; • Impact on outcomes.
Whether a physiotherapist is the most appropriate person to prescribe these exercises.	<ul style="list-style-type: none"> • Exercise training of a physiotherapist • Tools used to support process.
The level of fitness of the individuals.	<ul style="list-style-type: none"> • Would affect compliance and outcomes.
What other risk factors may be present e.g. excess weight, level of normal activity, attitudes beliefs and fears.	<ul style="list-style-type: none"> • Motivation to engage; • Attitudes and beliefs about their pain; • Over or under weight; • Familiarisation with regular activity.

Although in this case the conclusion from the reviews (stabilisation exercises are not more effective than any other form of active exercise) may be valid, the omission of the above highlights the possible flaws in literature that may then question the validity of a number of studies. These observations also highlight the complexity associated with a literature review of studies where the authors do not have access to or familiar with the raw data. Questions relating to whether physiotherapists, in general: have the knowledge and experience to deliver exercise regimes; should refer exercise prescription to exercise specialists; be trained to a higher level of exercise knowledge or whether a multidisciplinary approach should be considered, would benefit from further debate.

9.4.2.2. Interpretation issues

As an example, the NICE guidelines for the assessment and management of low back pain now suggest consideration of the psychological aspects affecting an individual and the provision of exercise including group exercise. A senior physiotherapist who is the manager of a national private network of both employed and network physiotherapists interpreted these guidelines as “little change” to previous guidelines and being what “physiotherapists do” and did not see the need to adapt practice. Whilst other participants involved in this research including a CCG and Health and Social Care Trust, evaluated the guidelines together with other information that was emerging from the Chartered Society of

Physiotherapy (CSP) and the NHS. Their interpretation was that they needed to change their practice and consider how they would need to train physiotherapists and potentially other clinicians in assessing and treating patients differently because what they believed the guidelines were suggesting is not what is commonly being practiced, hence two completely opposing interpretations.

9.4.2.3. Issues of ignorance or implications of findings

The findings of Brinjikji, et al., (2015) in relation to diagnostic imaging and *pain* clearly outline that the experience of pain may be not be as simple as the presence of a clinical condition (e.g. disc bulge). The authors of this research, and others that have conducted similar studies, have found that magnetic resonance imaging will identify a range of problems, often attributed to normal ageing and wear and tear. The percentage of individuals with these conditions that do suffer pain, compared with those that do not suffer pain or dysfunction, is similar, suggesting that *pain* is associated with some other phenomena. This could explain that when a surgeon, on observing these findings, performs surgery to address what they believe is the causation, why patients may attain initial relief but find that symptoms return. Conversely the clinician may believe that the surgery will not provide the answer but may be driven by patients to provide a treatment as it is the patients belief that this is what they need. The multifactorial nature of MSDs may explain why successful outcomes from the treatment of conditions such as back pain continue to trend downwards (Mafi, et al., 2013) and why the concurrent nature of pain and psychological factors are not being addressed (Leijon, & Mulder, 2009).

9.4.3. Non-clinical literature

Non-clinical literature (e.g. sports medicine and exercise journals) often consider a broader range of possible causative or contributory factors, including a greater depth of understanding of the implications of lack of appropriate exercise and excess weight. This literature whilst contributing significant insight to the biomechanical and biological aspects of MSDs may exclude other relevant factors, such as occupational tasks or psychosocial issues. The range of considerations are dependent on the author and the training and experience of those involved in the research and/or the specific aim of the research.

A few authors, including O'Sullivan et al., (2016), whose work straddles clinical and non-clinical publications, are recognising the multifactorial nature of low back pain and suggesting that the manner in which MSDs are assessed and treated needs to change (Walden, 2015a. 2017). The ongoing challenge appears to be the translation of research

into appropriate training, reflected in practice and measured for the effectiveness of the interventions, including patient satisfaction and whether improvements are sustained.

9.4.4. Grey literature

Information and materials from major UK wellbeing providers, limits mention of musculoskeletal health, for reasons that appear to reflect their uncertainty in this area. Although MSDs continue to represent the highest incidence of ill health in the workplace, the focus of wellbeing programmes (from discussions with major providers during this research but not referenced due to commercial sensitivity), suggests they accept that this is an area of wellbeing not really considered. A reason given for this omission was that how to prevent musculoskeletal ill health and injury was not evident in literature. Public health materials available to organisations or individuals also lack mention of musculoskeletal health, suggesting that this area of research has been ignored in the last one or two decades (Woolf, 2007). Although the HSE outline MSDs as one of their three priorities their focus for outcomes and priorities appears limited to work-related MSDs causation even though they accept that MSDs have physical and psychosocial elements and can be affected by activities outside of work and their general health (HSE, 2017). Why this is the case is unclear.

9.4.5. Literature and practice

Practice whether clinical or non-clinical, including managerial practice, is often influenced by what is evident in literature. The timing of such literature can therefore affect the introduction or otherwise of a change, which in the meantime at worst could cause harm.

9.4.5.1. Clinical

Whilst NICE guidelines, Cochrane and other literature reviews, are extremely helpful to clinicians (Santesso, et al., 2006), it is difficult for any provider of care (NHS or private) to manage the practice of clinicians across the vast array of knowledge, and the definition of what is evidenced based practice. Clinicians also encounter many non-clinical issues affecting the people they aim to treat and it is evident that practitioners now require further training to address these multiple issues as evidence was found during this research of non-evidence based procedures being performed

9.4.5.2. Management

HR professionals, line managers, health and safety practitioners rely on public information, health and safety publications and information provided by their professional bodies, which

often only reflect a snapshot of the issues and how to manage them (e.g. CIPD review of sickness absence, 2016). As such, these individuals may not be able to appraise the multifactorial nature of MSDs.

It is evident from discussions with the four participating organisations and other companies during the period of this research that managers require more information and support. Guidance on how to deal with the complex physical, psychological and social aspects of health, safety and wellbeing goes beyond that of the traditional occupational health provision to encompass an array of personal risks and human factors.

9.4.6. Summary

The search for an explanation for pain over the centuries remains unanswered, suggesting we are no closer to understanding this phenomenon yet we continue to treat pain and attribute causation to “possibilities” rather than realities.

Aiming to find a connection between pain and a specific clinical condition may not be the most appropriate empirical approach if the associated interventions do not deliver the expected patient outcomes. Consideration of the multiple health risk factors, which are affecting or may affect an individual, may assist in preventing or addressing a range of ill health conditions. Causes of ill health may present in different ways and the compartmentalisation of health conditions may be part of the problem. The link between psychological health and musculoskeletal health has been evident since the work of Engel in 1977 yet still not understood by many clinicians nor often present in common practice.

It is posited that musculoskeletal ill health has possible links to a number of different causative and contributory factors specific to an individual which increases the complexity of both assessing and treating each patient. What is evident is that for the benefit of patients, and reduction of unnecessary trauma and cost, we need to:

1. Consider other conservative options, as part of a treatment pathway *before* secondary care;
2. Evaluate the contribution of each risk factor and address the underlying problems rather than perform a procedure in the hope that this will deliver an outcome or as a response to keep a patient satisfied;
3. Educate patients on the range of issues that contribute to an MSD and that musculoskeletal health to be sustained, needs to be graduated over time and involve active engagement for life.

9.5. Intervention strategies

A review of common practice as documented in the literature and discussed in chapter 3 suggested that recognised research, that aimed to have progressed the understanding of musculoskeletal management, does not appear to have translated into practice models.

Information outlined in grey literature, observed from the documents analysed in chapter 6 and the direct conversations with symptomatic individuals (chapter 7) and practitioners (chapter 8) found that the actual models applied in the NHS and the private sector were somewhat limited.

9.5.1. NHS practice models

Within the NHS the most common route of entry is from a face-to-face assessment with the patients' General Practitioner (albeit that some NHS practices are now moving to a direct to physiotherapist model). This would then normally lead to a referral to a physiotherapist, unless a serious pathology found. The success of physiotherapy has not previously been measured but the introduction of the MSK-HQ questionnaire (Hill, et al., 2016) will mean that the outcome data will now be available. The data from this thesis suggests that if physiotherapy appears unsuccessful the individual would return to their GP and either be referred for an MRI scan or specialist appointment. This second stage assessment may result in more physiotherapy, injections or surgery. A GP may refer to several practitioners at the same time in the hope that this would reduce the pressure on his/her time and that the patient may find a solution via one of the routes with little consideration of the implications. Referrals to functional rehabilitation are rare, possibly due to lack of availability, whilst pain management referrals appear more common but often less "holistic" in approach.

Discussions with the local NHS practice as outlined in chapter 8 found a keen interest to identify the issues and change practice but acknowledged that this would take time.

9.5.2. Private practice models

In private practice the pattern would be very similar albeit that it is surmised that the incidence of surgery is higher in the private sector due to patient demand and the potential financial incentives for practitioners. This comment may appear to be conjecture but hearsay evidence from a hospital group and the incidence and costs within private healthcare plans suggest that there may be some evidence to support this supposition.

9.5.3. Summary

The data identified in the literature and from the three qualitative studies, was that the common practice for managing MSDs is mostly limited to the medical model. For members of the healthcare plans, ease of access to diagnostics and treatment combined with individual beliefs drive both incidence and cost. Practitioners were found to provide interventions based on a combination of their medical training and the demands of patients. The result of the interaction between patient and practitioner often leads to a short term “fix” rather than consideration of addressing the underlying risks that are likely to affect the individual in the longer term.

The process for accessing benefit whether NHS or private, the rules (where applicable) for claiming benefit, the opinion of the practitioner, the assessment process, combined with the treatment plan, all influence the individual and may affect behaviour negatively or positively (Main, Sullivan, & Watson, 2008). Consideration of a treatment structure, which encourages participation in exercise and a focus on fitness, may help reduce dependency on the NHS and private healthcare claims (Blair, et al., 2010).

This aspect of the research informed the need to explore knowledge of the theory and its practical application. Further research is needed to understand why practice is not reflecting the academic recommendations.

9.6. Prevalence, severity and misguided information

The ability to access data across the various employee benefit provisions within organisations is limited and it is believed that the data accessed for this research is unique. The volume of data captured from four major UK organisations provided an understanding of prevalence and cost previously unknown to any of the participating companies. Common language used by employers and published in grey literature was difficult to compare due to inconsistency or lack of clarity in definition and open to multiple interpretations. Grey literature publications appear to omit discussion, on for example, how variances in sickness absence recording or healthcare benefit provision can significantly change the interpretation.

The prevalence of other co-variables (normally not recorded or reported) across the symptomatic individuals within four organisations aimed to identify whether incidence of personal risk factors such as excess weight and inactivity, represented the averages reported in national statistics or were higher or lower for symptomatic individuals. The outcome identified the complexity of subjective reporting and in general, found excess

weight to be in similar proportions to the national statistics albeit that the population studied consisted of a lower average age. Inactivity across all organisations appeared well above the national averages and although potentially flawed due to subjective nature of the telephone assessment process and the potential for interpretational issues, the levels of inactivity remain a significant concern. Smoking and alcohol consumption appear low but are based on self-reports and any further discussion on these risks are omitted for the purpose of this study. Due to issues associated with the quantification of psychosocial factors, the prevalence of these issues could not be assessed in study 1a. The qualitative data provided across the three studies suggest that these factors are significant in potentially a high proportion of cases and as such further research is required to assess the presence of the different types of psychosocial traits and especially those that may be or become obstacles to recovery. Furthermore, training is necessary for practitioners in the identification and understanding of how to “treat” the various attitudes, beliefs, fears and behaviours that arise.

9.6.1. Organisational Level

Evidence within the literature, which details the extent to which MSDs arise in an organisation, was in general limited to the national statistics relating to sickness absence and work relatedness, and specific industry studies, that consider some aspects of the possible risk factors highlighted in this thesis.

Although MSDs and mental health problems rank as the two major reasons for long-term (greater than seven days) the current focus in organisations is prioritised towards mental health. Mental health has a higher incidence of work-relatedness and a longer length of absence but are both based on self-reports.

Objective data suggests that MSDs rank higher in both overall incidence and severity but for many the extent of the risk cost is unknown. Evidence of an understanding of the broader causative and contributory occupational and personal risks associated with MSDs was not apparent in any of the organisations participating in this research. Integrated data across all of the areas identified in this thesis would help organisations identify lost time, lost productivity, and total cost to the business of musculoskeletal ill health and injury.

The data presented to the participating organisations as part of this research highlighted the extent of the data “gaps” (Box 12).

Box 12: Missing data

Organisational knowledge gaps
<ol style="list-style-type: none">1. A misconception around the scale of MSD prevalence, incidence and cost;2. The lack of clarity on work-relatedness;3. The omission of personal risks in health and safety risk assessments and the need to be fit for purpose;4. The presence and significance of excess weight and inactivity in symptomatic individuals and the need to address them;5. The significance of the psychosocial factors;6. The lack of consideration in wellbeing provision of musculoskeletal health;7. The provision of unnecessary clinical treatments;8. The number of individuals on modified duties and how long they have been working with modifications to their former role.

A continuing focus on mental health in the national press and employee benefits publications appears to have distracted employers from the prevalence of MSDs.

9.6.1.1. Incidence – private healthcare plans

Incidence of musculoskeletal private healthcare claims are significantly higher than sickness absence incidence (study1) with a prevalence of circa 40%, considerably higher than any other single classification of disease and are, in most large organisations, also the most significant in terms of cost, but the population covered often senior and middle management. Prevalence in this population from often sedentary roles suggests that MSDs are no longer just associated with more manual work roles hence causation is somewhat different to that popularised theme of circa twenty-five years ago and which continue from the inferences of the Health and Safety Executive and other safety and or risk management organisations. Private healthcare is intended to be provided as a benefit but if this drives unnecessary or inappropriate diagnostics and treatments thus avoiding the underlying causation then the value of this benefit should now be questioned.

Conversely mental health, although lower in incidence compared to MSDs has a higher average number of days lost per episode (circa 30-40% higher) which can mean that the total number of days lost exceeds that of MSDs. The incidence in private healthcare plans averages a prevalence of 3-6% and the reason for such a low incidence is unknown but is suggestive of individuals not requiring treatment. It is sometimes argued that the provision of a private healthcare arrangement is for more senior managers who it could be

hypothesised suffer less mental health problems but this phenomenon occurs in healthcare plans that cover all or most employees.

9.6.1.2. Conflict of interest

Providers of private care (hospitals and practitioners) have a conflict of interest in that their income is generated from treating people and promotion of self-help would not be commercially beneficial in the short term. Conversely, insurance companies in the provision of fully insured contracts, should be motivated to align with such changes as they could benefit from reducing the cost of claims. This could significantly improve their underwriting profits and possibly allow reductions in insurance premiums and the ability to attract new customers. Major organisations would benefit the most as they would reduce claims costs but also the strategy applied should also reduce sickness absence from MSDs and potentially other conditions.

9.6.1.3. Access to musculoskeletal services

Prompt access to physiotherapy within the NHS is variable across the UK and by condition. Without a private healthcare benefit, employees with MSDs have difficulty in accessing prompt treatment. An equivalent musculoskeletal employee assistance programme (EAP) does not exist (other than that provided by the IHMP) which again underlines the focus on mental ill health rather than MSDs. Some employers provide access to physiotherapy as an adjunct to occupational health or occasionally a direct referral service but segmentation of the physical and psychological fails to understand the inextricable link between these and other conditions and the need to consider the whole person.

Employers that provide such access believe that this benefit will aid the individual remain at work in their normal duties or return them to work faster than would otherwise have been the case. An analysis of the Company D data found that direct referral, management referral and a referral via occupational health resulted in unnecessary treatment and failure to educate the employees in the management of their physical and psychosocial conditions.

This appeared to have arisen for a number of reasons:

1. The individuals belief that accessing physiotherapy would “fix them”;
2. A belief by the business that this would be the case;

3. A practice by the physiotherapists which may be driven by commercial reasons, ignorance or wish to satisfy the customer that they would provide the authorised number of sessions irrespective of whether treatment was necessary;
4. An ignorance by the physiotherapists of other possible interventions.

9.6.2. Individual Level

The clinical literature focuses on the ongoing debate relating to the cause and treatment of pain, evident for 7000 years, and which we continue to attempt to resolve with often-linear clinical solutions. Various interpretations associated with physical characteristics, psychological thoughts, feelings and beliefs about pain combined with social and environmental exposures and experiences including work, exist within the BPSM. Acceptance that we do not really understand pain and are being misdirected by the almost nirvana expectation of a pain solution may help refocus on the need for a more holistic understanding of our human self.

9.6.2.1. Musculoskeletal health

Although literature exists which considers the physical aspects of musculoskeletal health very little information is apparent in either public information and/or material or grey literature. Wellbeing or preventative health focuses on common problems such as cardiac and diabetes risks and encourages individuals to reduce weight, eat healthily and exercise regularly (Woolf, 2007). Advice and guidance on the prevention and management of MSDs was not evident in grey literature produced by the major providers of wellbeing programmes nor public health information albeit that some data does exist in literature e.g. stretching (Gartley & Prosser, 2011) but limited to a few authors (Woolf, 2012).

9.6.2.2. Excess weight

Clinicians participating in this research commented on the fact that excess weight is not a factor in assessing and treating MSDs possibly due to a focus in literature (or that which they have read) on the linear relationship between excess weight and pain. Public health material fails to provide information on the degree to which excess weight and obesity, if maintained over time can impact on the rate at which degenerative changes occur. The increased risk of problems such as disc bulges or herniation (Woolf & Pleger, 2003) due to the additional load placed on the musculoskeletal system (Somers, et al., 2012) is rarely discussed even though such data are available in academic literature. Excess weight and obesity may also be associated with the ability or motivation to keep active and take

regular exercise, including strength and conditioning training, and poor nutritional choices (Woolf & Pleger, 2003).

9.6.2.3. Activity and exercise

Inactivity is now one of the major health risks facing the western world but the latent risk of inactivity is rarely considered by clinicians in relation to MSDs (Bjorck-van Dijken, Fjellman-Wiklund & Hildingsson, 2008; McPhail & Schippers, 2012). A visual comparison from an MRI scan of a 74-year-old male triathlete, identified that bone density and muscle mass can be maintained to the same level of a 40-year-old triathlete, potentially extremely motivating to individuals who wish to reduce the effects of ageing. The comparison of the 74-year-old triathlete with a sedentary male of the same age, clearly demonstrated the muscle and bone wastage (Wroblewski, et al., 2011) from lack of exercise. The significance of such findings for Public Health and individual health are considerable yet the need to exercise regularly including recommendations on type, duration and intensity is somewhat lacking in both preventative and treatment literature and practice. Specific studies including RCT's have also demonstrated the benefits of exercise for conditions thought to be less responsive to conservative pathways (Brandt, 2004) such as osteoarthritis (Ravaud, et al., 2004), and rheumatoid arthritis (Brodin, Eurenus, Jensen, Nisell, & Opava, 2008).

The sedentary nature of modern life including sitting for sustained periods at desks, workstations, in cars, trains and aeroplanes is said to now be a risk as great as smoking (Buckley, et al., 2015). Without measuring activity most people are ignorant about how little we move but with the ability to now use mobile phones and wearable devices we can more accurately measure and understand how much exercise we actually take. This may include any activity that contracts the muscles and burns calories at a rate greater than the body would at rest (Hamilton, et al., 2012) or that which is planned, structured, repetitive and purposeful both of which can provide overall physical and psychological health benefits.

The guidance on activity and exercise, both cardiovascular and strength and conditioning, is arguably unclear especially when considered with working activities. Advice on type, frequency, duration, intensity, repetitions, and recovery is only provided in a basic format for general health with very little clarification between activity, exercise, work, age, and gender. Further research on how effective these public health recommendations are in the community (Garrett, Raina Elley, Rose & O'Dea, 2011) need to be undertaken and

compared with organisational directed programmes but specifically in relation to musculoskeletal health.

9.6.2.4. Psychosocial factors

Whilst the need to understand the possible psychological influences on musculoskeletal health and recovery from ill health are important, and remain relevant (Adler, 2009) it is apparent from the findings from this research that this approach continues to be neither understood or developed.

Although due to errors in recording the prevalence of psychosocial factors could not be quantified, the qualitative data suggests that these factors are evident in many cases and can, if not managed, become obstacles to recovery or may even be a causative factor where a belief drives a behaviour, which prevents an individual engaging in activities for good musculoskeletal health. Understanding the importance of these issues at an individual level was not found suggesting that a significant gap exists in patient education.

9.7. Individual themes

It is apparent that individuals believe that an MSD is a clinical condition that requires a clinical treatment and that this is driven by a number of different factors.

9.7.1. External influences

The plethora of information available to individuals via search engines, social media and grey literature is driving, consciously or unconsciously a self-diagnosis culture with an expectation of a specific diagnostic process (e.g. MRI scan) and treatment plan (e.g. surgery) based on lay knowledge in the absence of any relevant training or qualifications to guide the process. This behaviour in turn drives an increase in incidence within both the NHS and the private sector at primary care level, and may lead to secondary care.

Information from internet browsing on common conditions normally provides self-help advice and only suggests seeking treatment should certain conditions arise or if problems persist after expected recovery norms. Yet broader information viewed for this research but only referenced briefly in this thesis suggests that individuals do not wait or undertake self-help as part of the normal musculoskeletal recovery process.

9.7.1.1. Variations NHS and private care

The NHS and the private sector both report increasing MSD incidence suggesting that society appears to seek help and expect an intervention first. Data accessed in relation to

members of the private healthcare plans also suggested that the view by many claimants was that private healthcare treatment was thought to be higher quality of clinical care than that provided within the NHS. How this view had arisen, by unrelated members, across the organisations, could not be established. Such beliefs can arise for differing reasons including the simple provision of such a benefit can lead to this belief but publicity by major insurance companies many years ago and again media information has suggested that this may be the case.

9.7.2. Individual expectations

The issues identified from the documents and discussion with the symptomatic individuals, presented in chapter 6 of this thesis, suggest that they have an expectation that if they are referred by their GP to a musculoskeletal practitioner, that this individual will be able to identify and treat the problem successfully. The disparity between clinical findings and pain suggest that patients need to be made aware that potentially other factors are at play. Patients need to understand how they can address their problem, for their benefit and the benefit of their families (Ong & Richardson, 2006) to improve knowledge and outcomes.

9.7.2.1. Knowledge and beliefs

Study 1b and 2, provided insight into expectations, attitudes and beliefs and other possible latent reasons for dissatisfaction including dislike or disputes at work. The clinical and non-clinical data reviewed across the various benefit types aimed to reflect a snapshot of the issues the range of possible covariates including: gender, age, job type and personal risks. From the analysis of the documents and discussions with individuals, understanding of psychosocial factors was limited even though this has been discussed in literature for forty years and accepted as factors that clinicians should address since the introduction of the flag system (Kendal, et al., 1997). Consideration of the implications that excess weight and inactivity may have on the musculoskeletal system had not been considered by most participants.

9.7.3. Individual satisfaction

Level of patient satisfaction is not often measured. From the document analysis, focus group and one to one individual discussions very few patients had good outcomes and were satisfied. A theme for a positive response from physiotherapy appeared associated with those physiotherapists that had another form of training such as sports exercise medicine. Symptomatic individuals in the focus group and interviews both expressed satisfaction with such practitioners. Qualitative data from patients should be used (Grant,

2005) and be an integral part of future management of MSDs. The following two case studies are from a multidiscipline practitioner who participated in the research as outlined in chapter 8.

9.7.3.1. Two case studies from a practitioner's experience (chapter 8)

One patient following her attendance, over four weeks (circa 12 hours) at an FRP expressed how she felt following the programme compared to her life before. In this case, the individual patient felt considerably better and back in control of her life, yet her functional improvement was minor. This individual, if measured following a physical intervention, or for improvements in function, would not demonstrate a significant difference in her movement and the intervention deemed unsuccessful. A qualitative assessment of her attitude to her condition, her beliefs about what she can now do and her fears would show a considerable difference, underlying the concept that we may sometimes be measuring the less important outcomes. Understanding whether her psychosocial traits following the programme will allow her to lead a more fulfilled life and or whether further reinforcement of the messaging is required and if so in what time period would aid evaluation and development of the integration of the need to treat the whole person. Her employer stated that her attitude in general to work and life had changed, they felt she had moved from a "glass half empty" to a "glass half full" person and were surprised by the considerable difference that the programme had made in a relatively short time.

Another participant in the same programme explained how after forty years of a variety of treatments felt back in control. In this case, the individual felt that what was most important was the honesty associated with helping him understand what he could do to help himself, rather than continue to "do to him" and not "involve" him in his own rehabilitation to allow him to take control. From a psychological perspective, a person needs to feel in control and this *human need* does not appear to have been translated into management of physical health, ignoring that physical and psychological health are intrinsically linked.

9.7.4. Occupational influences

An added complexity of individuals within the workplace is that they may believe that a condition has been caused, or made worse, by work, when this is may not be the case. The practitioner is reliant on the individual's self-report and may not have access to other data that may balance or even contradict the patient's perception. The individual may be consciously, subconsciously or purposely seeking, a clinical justification not to work, to

have modifications to their duties or to support an incapacity claim or employer's liability claim. The practitioner on most occasions will be in a position of a therapeutic relationship with the patient and therefore either ignorant of other facts or placed within a possible conflicting situation.

Employers' and occupational health providers will have expectations of the practitioner that may exceed that of the practitioner's knowledge, training or skill adding to the complexity of the interaction with the patient. The clinician is reliant on the use of standard care pathways, developed on the assumption that our skeletal muscle system is similar across all Homo sapiens and any dysfunction is likely to be caused by the same problem and treated with the same care pathway. Patient reported outcome measures (PROMs) do not really appear to measure physical and psychological outcomes in a manner that would provide insight into this problem.

9.8. Practitioner themes

The main themes found from the data outlined in chapter 6, 7 and 8 suggest that clinical practitioners:

1. Rarely consider personal risks and only a few reviewed the occupational tasks or sporting activities;
2. On finding the presence of a condition on an MRI scan would often proceed to surgery unless familiar with functional rehabilitation;
3. May provide what a patient wants rather than what they need;
4. Are not familiar with how to treat psychosocial factors and often not familiar with the range of possible conservative treatments.

9.8.1. Practitioner and practice considerations

The expectation that a clinician can accurately diagnose a clinical problem from a subjective report by the individual relating to their pain is fraught with difficulty. Often there is no clear clinical diagnosis and this can then lead to frustration for the patient. The patient may demand diagnostics and treatment irrespective of whether this is appropriate. The complexity of issues presented by the patient in a manner, which the practitioner has to interpret and which may be outside of their knowledge, or skill set, leads to an expectation in the patient, that the practitioner cannot meet. Sometimes an individual may have access to information, which they misinterpret, or which drives a belief of what will help

them not understanding what they want may not be what they need and which may appear disrespectful to the clinician thus not helping the required therapeutic relationship.

9.8.1.1. Diagnostic assessment support

Although musculoskeletal practitioners, to aid the diagnostic process, use many questionnaires, it would appear that a validated tool, which assesses the multifactorial nature of MSDs, does not exist. The STaRT Back tool for the assessment of low back pain is arguably the most common predictive tool on the market but the outcome measure tool MSK HQ considers a broader range of issues but these factors are not considered during the assessment process. Validation of patient satisfaction and long-term outcomes was not apparent from the data.

9.8.2. Practitioner and patient interaction

The complexity of the symbolic interactionism between symptomatic individuals and the practitioner or practitioners and the extensive opportunity for issues of interpretation and understanding based on: language, ethnicity, age, education, gender, experience, attitudes, beliefs, fear and emotions were evident from the data accessed. The practitioner will need to interpret a patient's problem from the way in which they describe their condition. A patient may over or under report their symptoms or they may struggle to actually pinpoint the issue or describe their pain or dysfunction. They may miss out relevant data because they forget or they believe it is not important. The occupational issues outlined above add to this complexity.

9.8.2.1. Managing expectations

Patients often believe that a sophisticated diagnostic tool such as an MRI scan, is necessary to diagnose their condition. The presence of an apparent clinical condition (e.g. disc degeneration or bulge) is what the patient will assume is the cause of their pain and this may be suggested by the clinician, who advises the patient of the findings from the scan and then proposes what appears to be, or is interpreted as, an associated treatment. The clinician, based on their training, knowledge and experience, may only focus on clinical causation and may not consider other possible causative or contributory factors. The result may be a less than full recovery, as identified during this research. It is posited, that these multiple issues experienced by symptomatic individuals, are outside of the training and skills of most clinical practitioners (Akesson, Dreinhofer, & Woolf, 2003) and as such diagnostic and treatment practices need to change (Woolf, 2012; Woolf, Erwin & March, 2012).

9.8.2.2. Managing patient risks

It is evident that after forty years of research that knowledge of how to assess and treat the biopsychosocial issues has not transcended into clinical practice, even though exercise and psychological interventions are recommended for low back pain (NICE, 2016). The ongoing prevalence of excess weight and inactivity, whilst considered as a health risk for a range of other conditions including cardiac, cancer, and diabetes, also appear to have been ignored in clinical practice when assessing and treating MSDs (Woolf, 2012).

This was apparent from the documents analysed in chapter 6, the focus group and the one to one interviews with symptomatic individuals (chapter, 7) and the discourse with practitioners (chapter 8).

Engels' recommendations to move to a new medical model (Engel, 1989) is long overdue and training of practitioners in this area critical.

9.8.3. Practitioner challenges

The two main themes that emerged from the treating practitioners in discussion and from the document analysis were:

1. Insufficient training to meet the changing psychosocial issues and extent of personal risks;
2. Expectations of patients to be "fixed" leading to inappropriate demands.

9.8.4. Non-clinical practitioner variations

When an individual seeks treatment from a non-clinical practitioner, the expectation appears somewhat different in that the attitude of the individual at the point of consultation may reflect an expectation of needing to engage actively rather than passively, with the treatment. Alternatively, they may have reached this point having failed to achieve a successful clinical outcome.

It is possible that a competent holistic practitioner will have an array of skills that more closely match the expectations of the symptomatic individual than that of a clinician for the assessment and management of circa 80% of MSDs. For such treatment to be effective the presence of any serious clinical conditions needs to have been eliminated, the practitioner needs to be competent and the individual needs to be willing to engage.

9.8.5. Multiskilled practitioners or multidisciplinary teams

A multiskilled practitioner (with a clinical qualification combined with exercise, nutrition, weight management and psychosocial skills) may be able to satisfy the clinical expectations, challenge beliefs and provide long-term solutions to a patient. Such practitioners are rare and hence a multidisciplinary team may be able to offer a multidimensional approach.

The challenges facing practitioners cannot be ignored and possible solutions need to consider: the complexity of the patient; whether a single practitioner can be sufficiently trained to address all or most of the issues or whether practitioners need to work in multidisciplinary teams. Potentially the solution may be a combination of approaches, but further research needs to be conducted to establish the best approach and the associated care pathways.

9.9. Overview of the findings from this research

The concepts raised and the risks identified, have been welcomed by individuals and organisations (including practitioners and providers), who have participated in this research.

A summary of the main themes are:

1. The healthcare industry (including safety, health and wellbeing) operates in “silos” and this is reflected in organisational practice;
2. The medical model does not address the range of factors affecting an individual’s musculoskeletal health or treat all ill health problems;
3. Individuals need to understand how to take control;
4. Practitioners need training in the how to address the multifactorial presentations.

Whilst elements of this thesis may be thought to be well known and documented in publications, some of which have emerged recently, it is clear that what is reflected in practice is somewhat different. To achieve patient satisfaction that is sustained, we need to consider that human beings, are all so very different, and require a *whole person* tailored approach not the application of a single care pathway per clinical condition.

It is believed that the complexity of the issues addressed within this thesis will provide an understanding of why it is now necessary to change fundamentally the way in which we assess and treat MSDs and provide a framework for future research in these areas.

Combining quantitative and qualitative data as a norm, would aid understanding of the effectiveness of not only interventions but also the practitioners that deliver them and the ever-changing complexities of the patients that they aim to treat.

9.10. Conclusion

The quantitative data presented outlines the scale of MSDs yet the disparate nature of benefit provision means that organisations generally do not have sufficient data to understand the scale of both their occupational and personal risks factors, which may result in the implementation of inappropriate control measures or benefit provision, Literature on musculoskeletal health is scarce and omitted from most wellbeing advice. Lack of guidance and possible misdirection in health and safety advice, public and organisational health information has led to a misunderstanding of the issues. The British people and potentially many other populations within the western world have insufficient facts to help them reduce the risk of musculoskeletal ill health and or manage a condition as and when it occurs, such as evidenced based self-help techniques applicable to the management of many common MSDs.

The data gap means that individuals are likely to foster inappropriate beliefs and more inclined to seek advice from the medical profession, who will aim to help often by providing some form of “treatment”, in turn driving a higher than necessary incidence for the NHS and for organisations. To reduce prevalence and improve patient outcomes requires taking the complexity and converting this to a more simplistic delivery model. This will require changes to Government policies and practices, patient and practitioner education and the use of a multidimensional approach to the assessment and management of musculoskeletal health and conceptually a range of other diseases with similar causation.

Chapter 10

Recommendations

10. Introduction

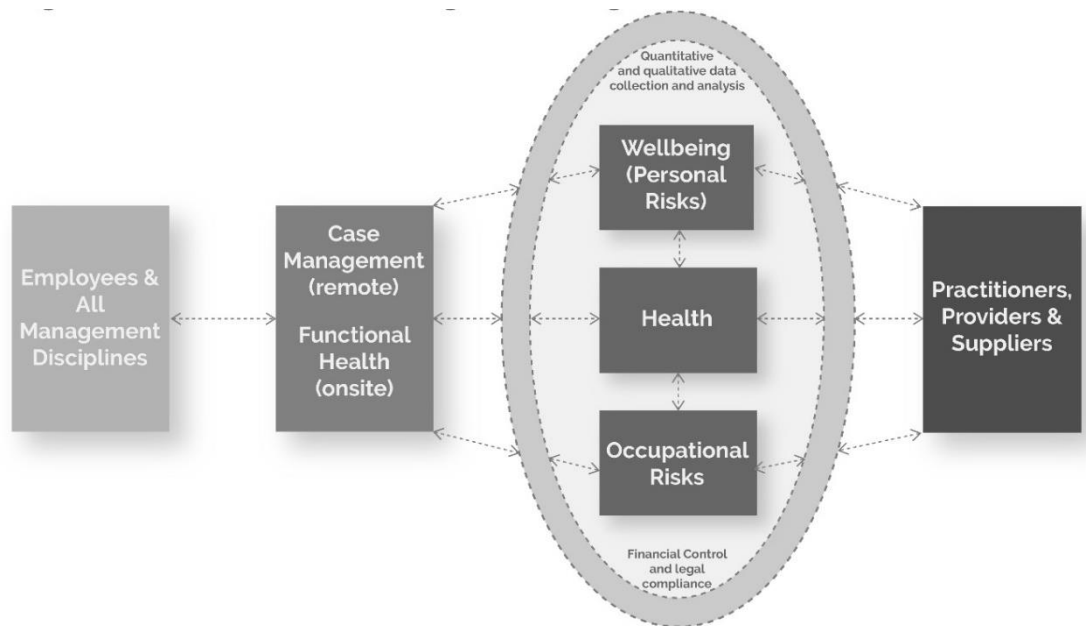
Chapter 9 summarised the issues identified within a model of *complexity* which whilst complex is also simple in that at the heart of the issue is an individual and that individual's interaction with others. At the core of the presentation of a musculoskeletal disorder is a lack of understanding by the individual and often the practitioners who aim to treat them, of the cause and contributory risk factors, compounded by the managers within the workplace who need to understand and address impact on ability to work underpinned by public health messaging and legislation.

This chapter offers recommendations that may be considered by the various stakeholders.

10.1. Simplicity at an organisational level

To simplify the assessment and treatment process it is necessary to ensure consistency and manage the message to the individual employees and to control the provision of any intervention (figure 11, page 236). This model proposes that employees and managers access information and have the ability to manage the complexity via a single access point or hub. This "hub" would then coordinate all assessment and management activities associated with the individual whether remote, on-site at their workplace or external access to diagnostics and treatment. The hub would consider the combination of both occupational and personal risks and how these may be the cause or contributory factors affecting the presenting health problem or may influence future wellbeing

A crucial element of this model is the data capture, quantitative and qualitative across all aspects of employee health, allowing insight into the person and their internal or external locus of control, thus providing an assessment and management process that is unique to the person.



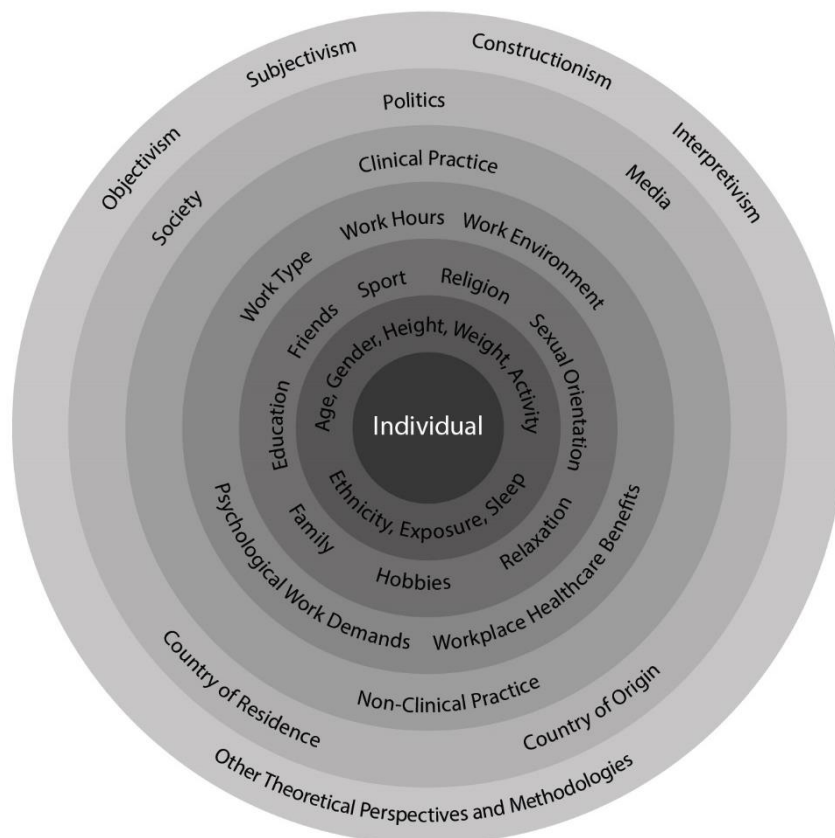
Gellatly, 2017

Figure 11: Integrated musculoskeletal management – organisational level

10.1.1. Integration of risks and benefits

To manage such an approach requires an organisation to integrate safety, health and wellbeing. This means that an organisation should consider its strategic approach to healthcare risk management and identify what it is trying to achieve and why. The answer for most organisations is that they wish to reduce the impact of ill health and injury on the business and the people working for it. Integration of occupational and personal risks, the provision of associated benefits and supply, provides the opportunity for an organisation to understand its specific work related risks and the risks inherent within the people that perform the tasks enabling better controls and measurement of effectiveness.

Organisations need, as a priority, to focus on obtaining robust quantitative data to help them understand the scale of the problem in their organisation and how the occupational and personal risks interface (e.g. whether an HGV driver who has a BMI of 35 kg/m² who takes very little exercise, has a poor diet and smokes cigarettes is fit to drive a 44-ton vehicle). Figure 12 (page 237) summarises the complexities of internal and external influences (not exhaustive) that can affect an individual both physically, psychologically and socially, inside and outside of work and underpins the broader biopsychosocial influences.



Gellatly, 2017

Figure 12: Summarises the range of personal and external complexities that can affect safety, health and wellbeing

10.2. Simplicity at the Individual Level

Individuals working for organisations can benefit from the approach outlined since the focus on the individual needs to consider the whole person at a physical, psychological and social level. This includes an understanding not only of the occupational risks but each individual's personal risks some of which extend beyond the scope of this thesis (e.g. ethnicity, genetics, co-morbidities).

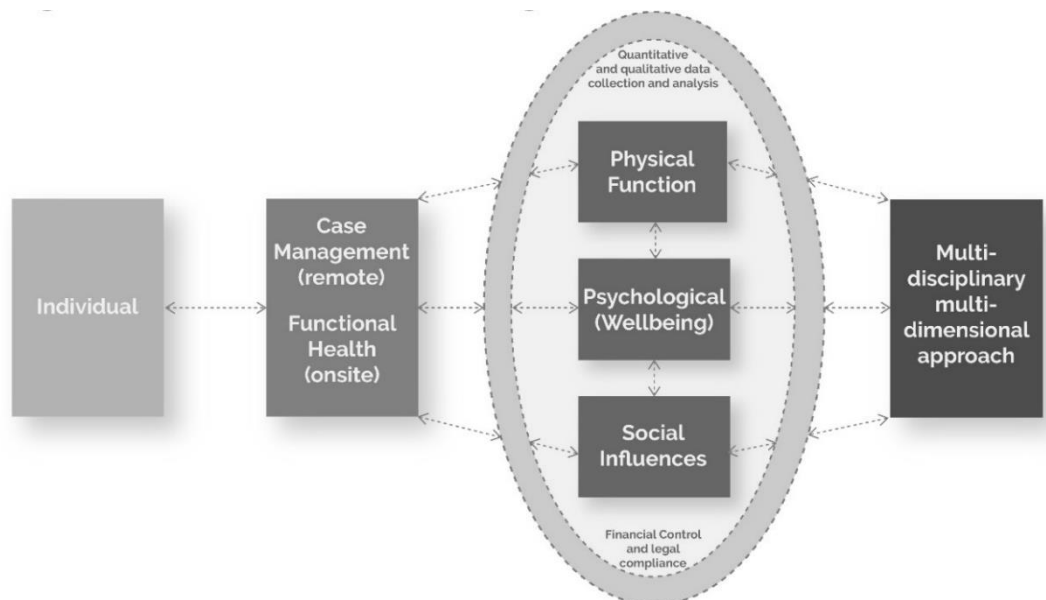
Employees and the population in general need to be educated in how to maintain or obtain good musculoskeletal health and the consequences if we do not as we age (e.g. premature reduction in mobility). Risk factors and their possible consequences include:

1. Excess weight and relationship to the rate of degeneration;
2. Inactivity, exercise, conditioning and the association with loss of strength, and muscle tone;
3. Poor posture, weak structure and the risk of imbalances from either or both of the above;

4. Dysfunction and the link to or other ill health problems (e.g. respiratory disorders);
5. Psychosocial factors such as beliefs that may drive individuals to a false understanding of reality.

10.2.1. Integration at the individual level in practice

The concept outlined in figure 11, which integrates occupational safety, health, and wellbeing at an organisational level, would also be integrated at the personal level to consider the physical, psychological, social and other external influences on musculoskeletal health, illness and injury (figure 12). The relevant risk factors and various influences would be assessed and managed (figure 13) for the benefit of the individual's, immediate and longer term health.



Gellatly, 2017

Figure 13: Integrated musculoskeletal health management – personal level.

Improving awareness, desire and knowledge of musculoskeletal health is aimed at motivating individuals to take personal action and responsibility. It is believed that such messages will need to be constantly reinforced and adapted throughout life if they are to be effective.

This means that the standard wellbeing programme that offers employees (or members of the public) an assessment but does not provide support to the individual to reduce their risks, over a period, is unlikely to be sufficient. Reducing health risks is complex enough but reducing musculoskeletal risks is more intricate as individuals do not witness the rate of deterioration of their skeletal muscle system, and often do not have any comprehension of

this occurrence until such time it affects mobility at which time they believe it is an inevitable consequence of ageing. Employers can play a major role in the education of employees, by providing information that challenges beliefs and incorporates the management of personal risks into their safety, health and wellbeing practices, rather than provide benefits that exclude the assessment and “treatment” of the underlying causation.

10.2.1.1. Managing the message to employees

The future provision of benefits to employees should be based on helping employees understand how and why they should take personal responsibility to manage their own health. The current provision of access to benefits, which rely almost entirely on the medical model and drive inappropriate behaviours and reliance on clinical practitioners, has to change. For this to be successful the message to employees, including managers, needs to be integrated and controlled to ensure that the individual truly understands the benefits to them rather than the possible belief of a cost cutting exercise. Each individual needs to understand how a whole person tailored approach can help them address their short and longer-term risks, for their benefit, the benefit of their families and the benefit of the business.

10.3. Public health education

Whilst employers can play, an important part in educating employees it is important that the risks associated with musculoskeletal health that impact ill health throughout life and as we age, need to be part of a broader public health campaign.

This would involve a broadening of education from various bodies including but not exhaustive:

10.3.1. Schools

An opportune time to provide strong teaching and physical education as the skeletal muscle system grows to encourage future good habits rather than the current physical deterioration of our children.

10.3.2. Recruitment and employment

The law needs to assist in this process by allowing employers to encourage fitness for purpose and the need for employees to remain fit for their work and fit for life. The current legislation (Equality Act 2010) is often interpreted to give reasons why employers can no longer manage fitness for work exposing employees to a higher risk of injury and ill health. Health and safety legislation should also include reference to the personal risks and

the need for personal responsibility rather than continue to suggest that the causation of musculoskeletal ill health and injury is work related.

10.3.3. Risk management organisations

Bodies such as the Institute of Risk Management and the Association of Insurance Risk Management in Industry and Commerce should educate and actively encourage their members to consider the personal risks.

10.3.4. Department of Health and the National Health Service (NHS)

The ongoing rate of musculoskeletal incidence and associated cost is driving change in the NHS and concepts not dissimilar to the integrated (figure 11) model are being considered. The NHS at a local level have also expressed the need to move towards an integrated personal risk model (figure 13) but believe that this will be very difficult to achieve. Lack of knowledge of how this could be achieved, the management of the conflicts of change, and the public perception of cost cutting, are likely to mean that real improvements may not be realised for many years. The removal of the NHS from political “footballing” would increase the rate of change.

10.3.5. Clinical bodies

Organisations such as the British Medical Council, General Medical Council and Chartered Society of Physiotherapists should recognise the changing societal issues and aid their members in how to deal with the multifactorial health risks. In their position of authority in such matters, they can drive further research and develop specific training for practitioners to guide the encouragement of helping individuals to help themselves. A coordinated approach and consistent messaging could start reducing the pressure on NHS practitioners. These bodies should also closely monitor the practice of practitioners who provide private treatment to ensure that they do not deliver inappropriate or unnecessary interventions.

10.3.6. Clinical practitioners

Need to voice concerns about the issues that they face and the expectation that they can solve problems for which they have little or no training.

There are two main obvious elements to explore:

1. The provision of a multidisciplinary approach to access the skills of various practitioners to address individuals' needs based on training practitioner (clinical and non-clinical) to understand the range of issues and how best to address them by referral to the most appropriate practitioner;

2. To train interested practitioners in a broader range of skills so that individual practitioners could address a wider array of risks.

10.3.7. Sports and exercise medicine bodies

Organisations including internationally recognised associations (e.g. National Association of Sports Medicine) should consider their role and how their skills could either improve the knowledge of clinicians or be used within a multidisciplinary team or a combination thereof.

10.3.8. Wellbeing providers

Should develop musculoskeletal assessment tools and processes similar to those of the sports and exercise professionals. These providers should then also have referral mechanisms in place to assist individuals identified with issues, which may be causing or likely to cause problems.

10.3.9. Insurance companies

Should review benefit structures to enable individuals to address the non-clinical risks and provide support for the assessment and management of non-clinical and clinical risks. In addition, such companies should avoid the funding of unnecessary or inappropriate diagnostics and treatment.

10.3.10. Large employers

As the government need their support to assist in the provision of preventing and managing ill health, employers can work together to provide a useful insight to the government on the range of issues and also can demand and effect change.

10.3.11. The Government

Should consult with large employers, review public health materials and manage negative messaging and legislation (e.g. health and safety). The government should also consider how legislation, developed with the intent of protecting individuals from discrimination, is also negatively affecting health and behaviours.

10.3.12. Media

Active promotion of personal responsibility for health and the importance of self-help should help change attitudes and beliefs towards the NHS, the private sector and work rather than continue to externalise blame.

10.4. Desired outcomes

It is hoped, that the findings from this research will help:

1. Understand why physical deterioration has been ignored for so long;
2. Encourage individuals to understand underlying causation and take personal ownership;
3. Practitioners identify and treat the multifactorial risk factors;
4. Encourage organisations and their providers, to change the way in which musculoskeletal health and ill health is managed.
5. The Department of Health and the NHS to develop new care pathways to include self-management, provides less intervention and help patients understand that appropriate treatment is often in their control;
6. Drive further research especially that which embraces a multidisciplinary and multidimensional approach;
7. Make that paradigm shift to reduce the suffering of future generations by refocusing on the *whole person* rather than trying to establish a single linear relationship to understand pain alone and in doing so address a multitude of other ill health conditions.

10.5. Conclusion

Although the focus of this research has been on MSDs, many of the underlying risk factors that affect employees and their ability to work, are potentially causative and contributory risks to a range of other ill health problems. The interrelationship between our physical and psychological selves suggest that isolating an approach for a single condition (the current medical model) needs to change. It is proposed that focus on the *whole person* and the need to assess the range of risk factors that cause or contribute to a diverse array of ill health conditions would provide better patient outcomes, together with reduction in organisational and public health risks and associated costs.

It is hoped that this thesis has provided the stimulus for future developments in these areas.

Chapter 11

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11. References

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Appendix 1

healthcare rm

Introduction

The author founded healthcare rm in 2000 following a pilot with the manufacturing company featured in this thesis. The organisation provides an integrated approach to employee health risk management, an approach which is fundamentally different to the traditional occupational health service.

As an organisation the company works with large organisations as featured in the research and small and medium sized companies. It also interfaces with a range of other organisations including: the NHS; private healthcare companies; occupational health providers; wellbeing suppliers; employee assistance companies; group income protection providers; employer's liability insurance companies; physiotherapy and psychological service organisations; hospitals; surgeons; physicians; GPs and nurses.

Services provided

The following is a brief list of the services provided and which have been adapted following the emergence of the data from this research and the ability to implement improvements to the management of organisational and personal health.

Safety related

- On-employment assessments to establish fitness for purpose;
- Vehicle assessments;
- DSE assessments;
- Health surveillance (statutory requirement based on exposures;
- Manual handling – a new approach to improvements in function.

Health related

- First day sickness absence management with associated interventions where appropriate; e.g. MSD would offer a telephone assessment with a physiotherapist;
- First week sickness absence – for smaller organisations;

- Management advice line – to support managers in the day to day management of any health problem;
- Management referrals – for individuals with a health problem who may be absent or may be at work to assess and manage any issue identified;
- Healthcare plan administration – normally via a Medical Trust
- Careline – an alternative to an Employee Assistance Programme but includes MSD and Lifestyle advice and management;
- Group income protection and Employer's liability case management.
- Musculoskeletal, Mental Health and Nutritional workshops.

Wellbeing

- Functional movement screens;
- On-site lifestyle assessments;
- Coaching;
- Access to on-line assessments and health education materials.

Appendix 2

Ethics Approval



University of
Chester

**Faculty of Applied Sciences
Research Ethics Committee**

frec@chester.ac.uk

11 February 2013

Pamela Gellatly
The Bothy,
Old Birchend Farm,
Castle Frome,
Herefordshire
HR8 1HF

Dear Pamela

Study title: *"A retrospective analysis of the effectiveness of an integrated approach to employee health risk management"*

FREC reference: 757/13/PG/CS

Version number: 1

Thank you for the above application which was considered by the Faculty Research Ethics Committee at the meeting held on 23rd January, 2013.

I am pleased to inform you that there were no ethical objections to this study taking place and that the application was approved.

Good luck with your studies.

Yours sincerely,

Prof. Cynthia Burek
Chair, Faculty Research Ethics Committee

Enclosures: Response to FREC template
C.c. Supervisor FREC Representative

FREC D
Provisional opinion post-FREC meeting

1



University of
Chester



**Faculty of Life Sciences
Research Ethics Committee**

frec@chester.ac.uk

Pamela Gellatly
Castle Frome
Herefordshire

29th September 2014

Dear Pamela,

Study title: The Assessment, Treatment and Management of Musculoskeletal Disorders – Practitioners' Perspective.
FREC reference: 874/14/PG/CSN
Version number: 1

Thank you for sending your application to the Faculty of Life Sciences Research Ethics Committee for review.

I am pleased to confirm ethical approval for the above research, provided that you comply with the conditions set out in the attached document, and adhere to the processes described in your application form and supporting documentation.

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Application Form	1	December 2013
Appendix 1 – List of References	1	December 2013
Appendix 2 – C.V. for Lead Researcher	1	December 2013
Appendix 3 – Letter of Invitation	1	December 2013
Appendix 4 – Participant Information Sheet	1	December 2013
Appendix 5 – Participant Consent Form	1	December 2013
Appendix 6 – Practitioner Interview Guide	1	December 2013
Appendix 7 – Practitioners' Perspective, Information on Healthcare RM	1	December 2013
Supplementary information in relation to the Practitioners' Perspective	1	September 2014

Approval letter 2014-15

Please note that this approval is given in accordance with the requirements of English law only. For research taking place wholly or partly within other jurisdictions (including Wales, Scotland and Northern Ireland), you should seek further advice from the Committee Chair / Secretary or the Research and Knowledge Transfer Office and may need additional approval from the appropriate agencies in the country (or countries) in which the research will take place.

With the Committee's best wishes for the success of this project.

Yours sincerely,



Dr. Stephen Fallows
Chair, Faculty Research Ethics Committee

Enclosures: Standard conditions of approval.

Cc. Supervisor/FREC Representative



University of
Chester

Faculty of Life Sciences
Research Ethics Committee

frec@chester.ac.uk

Pamela Gellatly
Castle Frome
Herefordshire

12th June 2014

Dear Pamela,

Study title: The Assessment, Treatment and Management of the
Musculoskeletal Disorders – Experiences of Symptomatic
Individuals.
FREC reference: 875/14/PG/CSN
Version number: 2

Thank you for providing notice of variation to the above project.

The following variation has been approved by the Faculty Research Ethics Committee:-

- To interview Symptomatic Individuals either via a telephone call or at a face to face meeting. Telephone interviews will be conducted from the office of the Lead Researcher and face to face interviews will be conducted at either the GP Practice of the Symptomatic Individual, their home or a local hotel. All other criteria will remain as per the application.
- A revised Letter of Invitation and Participant Information Sheet relative to this amendment.

With the Committee's best wishes for the success of this project.

Yours sincerely,

Dr. Stephen Fallows
Chair, Faculty Research Ethics Committee



University of
Chester

**Faculty of Life Sciences
Research Ethics Committee**

frec@chester.ac.uk

Pamela Gellatly
The Bothy
Old Birchend Farm
Castle Frome
Herefordshire
HR8 1HF

17th February 2014

Dear Pamela,

Study title: The Assessment, Treatment and Management of the
Musculoskeletal Disorders – Experiences of Symptomatic
Individuals.
FREC reference: 875/14/PG/CSN
Version number: 2

Thank you for providing the documentation for the amendments recommended following the approval of the above application. These amendments have been approved by the Faculty Research Ethics Committee.

With the Committee's best wishes for the success of this project.

Yours sincerely,

Dr. Stephen Fallows
Chair, Faculty Research Ethics Committee



University of
Chester

**Faculty of Life Sciences
Research Ethics Committee**

frec@chester.ac.uk

Pamela Gellatly
The Bothy
Old Birchend Farm
Castle Frome
Herefordshire
HR8 1HF

10th February 2014

Dear Pamela,

Study title: The Assessment, Treatment and Management of Musculoskeletal Disorders – Experiences of Symptomatic Individuals.
FREC reference: 875/14/PG/CSN
Version number: 1

Thank you for sending your application to the Faculty of Life Sciences Research Ethics Committee for review.

I am pleased to confirm ethical approval for the above research, provided that you comply with the conditions set out in the attached document, and adhere to the processes described in your application form and supporting documentation. However, the Committee would like to request the following amendments:-

- On the application form, complete the 'vulnerable groups' section and confirm that the data will be stored confidentially.
- On the Consent Form (section 3) include consent for the focus group to be video recorded.
- Consider a maximum of six participants for each focus group.
- On the Participant Information Sheet in the section 'What will happen to the results of the research study?' correct the spelling of the word 'multidisciplined' and remove your personal mobile telephone number.

Please forward electronic copies of the amended documentation to frec@chester.ac.uk

Approval letter – 2013/14

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Application Form	1	December 2013
Appendix 1 – List of References	1	December 2013
Appendix 2 – C.V. for Lead Researcher	1	December 2013
Appendix 3 – Letter of Invitation to Participants	1	December 2013
Appendix 4 – Participant Information Sheet	1	December 2013
Appendix 5 – Participant Consent Form	1	December 2013
Appendix 6 – Interview Schedule	1	December 2013
Appendix 7 – Consent from organisations to use their data	1	December 2013
Appendix 8 – Information on Healthcare RM (the employer of the Lead Researcher)	1	December 2013

Please note that this approval is given in accordance with the requirements of English law only. For research taking place wholly or partly within other jurisdictions (including Wales, Scotland and Northern Ireland), you should seek further advice from the Committee Chair / Secretary or the Research and Knowledge Transfer Office and may need additional approval from the appropriate agencies in the country (or countries) in which the research will take place.

With the Committee's best wishes for the success of this project.

Yours sincerely,



Dr. Stephen Fallows
Chair, Faculty Research Ethics Committee

Enclosures: Standard conditions of approval.

Cc. Supervisor/FREC Representative

10/11/2015

Pamela Gellatly
Bosbury
Herefordshire

Dear Pamela

Study title: *Additional qualitative analysis of documents relating to the musculoskeletal cases reviewed in the quantitative study 757/13/PG/CS and the qualitative study 874/14/PG/CS*

FREC reference: 1132/15/PG/CSN

Version number: 1

Thank you for sending your application to the Faculty of Medicine, Dentistry and Clinical Sciences Research Ethics Committee for review.

I am pleased to confirm ethical approval for the above research, provided that you comply with the conditions set out in the attached document, and adhere to the processes described in your application form and supporting documentation.

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Application Form	1	October 2015
Appendix 1 – List of References	1	October 2015
Appendix 2 – Summary CV for Lead Researcher	1	October 2015
Appendix 3 – Illustration of data convergence from the four studies within this research project.	1	October 2015
Appendix 4 – Sample consent from used in Study 1 & 2	1	October 2015
Response to FREC request for further information or clarification	1	October 2015

Please note that this approval is given in accordance with the requirements of English law only. For research taking place wholly or partly within other jurisdictions (including Wales, Scotland and Northern Ireland), you should seek further advice from the Committee Chair / Secretary or the Research and Knowledge Transfer Office and may need additional approval from the appropriate agencies in the country (or countries) in which the research will take place.

Approval 2015/16

With the Committee's best wishes for the success of this project.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Ben Green', with a horizontal line underneath.

Professor Ben Green
Chair, Faculty Research Ethics Committee

Enclosures: Standard conditions of approval.

Cc. Supervisor/FREC Representative

Approval 2015/16

With Compliments

29/05/14



University of
Chester

Simon Ricketts,

Attached approval letter. Please may I ask
if you could have the attached Confidentiality agreement
signed and returned in the enclosed envelope -
my apologies for not passing it to you at the
meeting.

With many thanks. Kind regards, Kevin

University of Chester, Parkgate Road, Chester CH1 4BJ • Tel 01244 511000 • Fax 01244 511300 • www.chester.ac.uk • Registered Charity 525938



University of
Chester

**Faculty of Life Sciences
Research Ethics Committee**

frec@chester.ac.uk

Pamela Gellatly
The Bothy
Old Birchend Farm
Castle Frome
Herefordshire
HR8 1HF

10th February 2014

Dear Pamela,

Study title: The Assessment, Treatment and Management of Musculoskeletal Disorders – Experiences of Symptomatic Individuals.
FREC reference: 875/14/PG/CSN
Version number: 1

Thank you for sending your application to the Faculty of Life Sciences Research Ethics Committee for review.

I am pleased to confirm ethical approval for the above research, provided that you comply with the conditions set out in the attached document, and adhere to the processes described in your application form and supporting documentation. However, the Committee would like to request the following amendments:-

ask Steve

- On the application form, complete the 'vulnerable groups' section and confirm that the data will be stored confidentially.
- On the Consent Form (section 3) include consent for the focus group to be video recorded.
- Consider a maximum of six participants for each focus group.
- On the Participant Information Sheet in the section 'What will happen to the results of the research study?' correct the spelling of the word 'multidisciplined' and remove your personal mobile telephone number.

Please forward electronic copies of the amended documentation to frec@chester.ac.uk

Approval letter – 2013/14

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Application Form	1	December 2013
Appendix 1 – List of References	1	December 2013
Appendix 2 – C.V. for Lead Researcher	1	December 2013
Appendix 3 – Letter of Invitation to Participants	1	December 2013
Appendix 4 – Participant Information Sheet	1	December 2013
Appendix 5 – Participant Consent Form	1	December 2013
Appendix 6 – Interview Schedule	1	December 2013
Appendix 7 – Consent from organisations to use their data	1	December 2013
Appendix 8 – Information on Healthcare RM (the employer of the Lead Researcher)	1	December 2013

Please note that this approval is given in accordance with the requirements of English law only. For research taking place wholly or partly within other jurisdictions (including Wales, Scotland and Northern Ireland), you should seek further advice from the Committee Chair / Secretary or the Research and Knowledge Transfer Office and may need additional approval from the appropriate agencies in the country (or countries) in which the research will take place.

With the Committee's best wishes for the success of this project.

Yours sincerely,



Dr. Stephen Fallows
Chair, Faculty Research Ethics Committee

Enclosures: Standard conditions of approval.

Cc. Supervisor/FREC Representative

Standard conditions of approval**1. Further communications with the Faculty Research Ethics Committee**

- 1.1 Further communications during the research with the Faculty Research Ethics Committee (hereafter referred to in this document as "the Committee") are the personal responsibility of the Lead Researcher (the Applicant).

2. Commencement of the research

- 2.1 It is assumed that the research will commence within 12 months of the date of the favourable ethical opinion.
- 2.2 Should the research not commence within 12 months, the Lead Researcher should give a written explanation for the delay. It is open to the Committee to allow a further period of 12 months within which the research must commence.
- 2.3 Should the research not commence within 24 months, the favourable opinion will be suspended and the application would need to be re-submitted for ethical review.

3. Duration of ethical approval

- 3.1 The favourable ethical opinion for the research applies for the expected duration of the research as specified in the application form. If it is proposed to extend the duration of the study, this should be submitted for approval as a substantial amendment.

4. Progress reports

- 4.1 The Lead Researcher should submit a progress report to the Committee 12 months after the date on which the favourable opinion was given. Annual progress reports should be submitted thereafter.

5. Amendments

- 5.1 If it is proposed to make a substantial amendment to the research, the Lead Researcher should submit a notice of amendment to the Committee.
- 5.2 A substantial amendment is any amendment to the terms of the application for ethical review, or to the protocol or other supporting documentation approved by the Committee, which is likely to affect to a significant degree:
- a. the safety or physical or mental integrity of the participants;
 - b. the scientific value of the research;
 - c. the conduct or management of the research.
- 5.3 Notices of amendment should be personally signed by the Lead Researcher.
- 5.4 A substantial amendment should not be implemented until a favourable ethical opinion has been given by the Committee, unless the changes to the research are urgent safety measures (see section 6). The Committee is required to give an opinion within 15 working days of the date of receiving a valid notice of amendment.



- 5.5 Amendments that are not substantial amendments ("minor amendments") may be made at any time and do not need to be notified to the Committee.

6. Urgent safety measures

- 6.1 The Lead Applicant may take appropriate urgent safety measures in order to protect research participants against any immediate hazard to their health and safety.
- 6.2 The Committee must be notified within three days that such measures have been taken, the reasons why and the plan for further action.

7. Serious Adverse Events

- 7.1 Any Serious Adverse Event (SAE) occurring to a research participant must be promptly notified to the Committee where it is considered possible that the event resulted from their participation in the research. An SAE is an untoward occurrence that:

- a. results in death;
- b. is life-threatening;
- c. requires hospitalisation or prolongation of existing hospitalisation;
- d. results in persistent or significant disability or incapacity;
- e. is otherwise considered significant by the investigator.

- 7.2 Reports of SAEs should be provided to the Committee within 15 days of the Lead Researcher becoming aware of the event.

- 7.3 The Lead Researcher may be requested to attend a meeting of the Committee or Sub-Committee to discuss any concerns about the health or safety of research participants.

8. Conclusion or early termination of the research

- 8.1 The Lead Researcher should notify the Committee in writing that the research has ended within 90 days of its conclusion. The conclusion of the research is defined as the final date or event specified in the protocol, not the completion of data analysis or publication of the results.

- 8.2 If the research is terminated early, the Lead Applicant should notify the Committee within 15 working days of the date of termination. An explanation of the reasons for early termination should be given.

9. Final report

- 9.1 A copy of the abstract/ executive summary of the thesis/ dissertation/ report should be sent to the FREC Secretary within 6 months of the conclusion of the study.

10. Review of ethical opinion

- 10.1 The Committee may review its opinion at any time in the light of any relevant information it receives.
- 10.2 The Lead Researcher may at any time request that the Committee reviews its opinion, or seek advice from the Committee on any ethical issue relating to the research.

11. Breach of approval conditions

- 11.1 Failure to comply with these conditions may lead to suspension or termination of the favourable ethical opinion by the Committee

Appendix 3

Topic Guides

Symptomatic Individuals Focus Group Topic Guide

Topic: Attitudes, beliefs and fears and relevance of lifestyle factors relating to the management of musculoskeletal problems

Introduction

Thank you for agreeing to attend this meeting today in relation to exploring individual views and experiences relating to the assessment, treatment and management of musculoskeletal problems.

This research is being conducted to help us understand symptomatic individuals' expectations when being assessed and treated for a range of musculoskeletal problems including back pain, knee and hip problems, shoulder complaints etc.

Individual beliefs about the cause of their pain have been known to affect patient outcomes for more than 15 years. Yet how often this is considered managed by the range of different musculoskeletal practitioners has not really been assessed for sometime.

Also we are trying to identify how symptomatic individuals understand other factors such as age, gender, weight, exercise and nutrition.

The format of the meeting is that I would like you all to first initially introduce yourself and briefly state what musculoskeletal problem you have. I will then start asking questions and what normally happens is that people start sharing their experiences, their attitudes, beliefs and fears about their pain.

The meeting will be recorded but the meeting and the data are confidential. Any information on you will be anonymised so Participant 1, 2 etc. The data will analysed by me to identify any trends that are identified from this meeting and other Focus Groups.

Conducting

Can you each tell us a little about your condition and how it affects you?

Topics

- Information provided by GP
- Types of referral
- Information provided by the person to whom you were referred
- Individual decision to seek treatment
- What treatment has worked
- Causation of pain and dysfunction
- Underlying issues
- Understanding of psychosocial factors
- Understanding of weight, exercise and nutrition
- Effect of age
- Gender issues
- Impact on occupation
- Impact on life in general
- Any experiences with non-clinical interventions
- What coping strategies do people use
- How effective are they
- Anything else you feel would benefit

Is there anything else anyone would wish to add?

Closing

On a final note, can you all think of one self-help tip that helps you prevent or manage your pain?

Thank you all for your participation.

Your information will remain confidential and if anyone is interested in how the data are being used to improve patient experiences of managing musculoskeletal pain then I would be happy to keep in touch.

Practitioner Interview Topic Guide

Name:

Contact Details:

.....

Date of Birth:/...../.....

Name of practitioner:

Type of practitioner (e.g.: GP, Orthopaedic Surgeon, Physiotherapist, Corrective Exercise specialist etc.):

.....

Qualifications:

Number of years in practice:

1-5 ☐ 5-10 ☐ 11-15 ☐ 16+ ☐

Type of Specialty by Body Area: (Tick areas that apply)

Foot	<input type="checkbox"/>	Knee	<input type="checkbox"/>	Hip	<input type="checkbox"/>	Arms	<input type="checkbox"/>
Ankle	<input type="checkbox"/>	Lower Limb	<input type="checkbox"/>	Upper Limb	<input type="checkbox"/>	Shoulders	<input type="checkbox"/>
Neck	<input type="checkbox"/>	Lower Back	<input type="checkbox"/>	Upper Back	<input type="checkbox"/>	Head	<input type="checkbox"/>

Specialist procedure (if applicable):

.....

What types of assessment do you do when attempting to diagnose and treat a patient?

.....

Please outline the type of physical assessments to include both objective and subjective measures and what supporting assessment tools you use if any?

.....
.....

How does this vary based on age and or gender?

.....
.....

What type of psychosocial assessment do you conduct (if any)? Please indicate whether you take such factors into account and whether you use any tools to support this process?

.....
.....

What type of lifestyle indicators do you take into account? (e.g.: Exercise, Weight, BMI, Nutrition, Smoking, Alcohol use etc.)

.....
.....

What occupational factors do you take into account? (e.g.: hours of shift work, sedentary, manual handling, psychological demands etc.)

.....
.....

Do you take in to account other common maintenance factors of obstacle to recovery? (e.g.: sick pay, performance issues, incapacity etc.)

.....
.....

How do you manage/treat the issues outside of your prime area of specialism? (e.g.: Psychosocial issue, weight, lack of exercise etc.)

.....

.....

What do you feel is the importance of language when talking to a patient?
(e.g.: Do you use medical terms such as degenerative disc disease or do you try to normalize the problem for the patient?)

.....

.....

When developing your treatment plan what options do you offer the patient?

- If a surgeon, do you only offer surgical solutions?
- Do you have an opportunity to refer to other conservative pathways?
- Do you use Functional Rehabilitation Programmes?
- Do you use Pain Management Programmes?
- Do you use Corrective Exercise?
- Do you offer weight management?
- Do you offer nutrition advice?
- Do you use exercise on prescription?
- Do you have any other non-surgical solutions including acupuncture etc.?
- Other?

.....

.....

How much do you feel a patient drives the treatment process?

.....

.....

If a patient has access to private healthcare do you find that they drive the treatment process more than NHS patients?

.....

.....

Do you feel additional support services would help you manage your patients?

.....

.....

Appendix 4

Participant Information Sheet



Participant Information Sheet

The Assessment, Treatment and Management of Musculoskeletal Disorders – A Practitioners Perspective.

You are being invited to take part in a mixed methods research study. Before you choose to participate it is important for you to understand why the research is being conducted, what it will involve and who it will involve.

Please take time to read the following information carefully and discuss it with others if you wish. If there is anything that is not clear or if you would like more information then please contact the Lead Researcher. Take time to decide whether or not you wish to take part.

What is the purpose of the study?

The research is being undertaken to review the multifactorial issues associated with the assessment and treatment of a patient with musculoskeletal disorders.

Why have you been chosen?

You are a professional with whom the Lead Researcher or Healthcare RM will have worked with and may be a clinical or non-clinical practitioner involved in the assessment, treatment and management of musculoskeletal disorders.

Do you have to take part?

It is up to you to decide whether or not to take part. If you decide to take part you will be given this information sheet to keep. If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect you in any way.

What is the process if you choose to take part?

You will simply need to agree to meet the Lead Researcher at a location convenient to you or to arrange a time when you the interview could be conducted by telephone.

What are the possible disadvantages and risks of taking part?

There are no disadvantages or risks foreseen in taking part in the study.

What are the possible benefits of taking part?

The objective of the study is to understand the views of both the practitioners and the individuals to develop solutions to help practitioners deliver better outcomes. It is expected

that practitioners will be interested to learn what the various disciplines may offer each other and how the individual may be better educated to self-manage the underlying causative and contributory factors.

If more individuals can self-manage their problems via exercise, nutrition, weight management and other coping strategies then this should reduce the number of “revolving door” patients and allow practitioners more time with the individuals that truly need the specific clinical or non-clinical skill of the individual practitioner.

If this study is successful then it is hoped that the information may be used for all practitioners to better identify the range of issues that can lead to musculoskeletal pain and dysfunction and provide practitioners with a range of other self-help, guided self-help, referral and treatment options.

What if something goes wrong?

If you wish to complain or have any concerns about any aspect of the way you have been approached or treated during the course of this study, please contact Professor Sarah Andrew, Dean of the Faculty of Applied Sciences, University of Chester, Parkgate Road, Chester, CH1 4BJ, 01244 513055.

Will your taking part in the study be kept confidential?

All information, which is collected, about you and your practice during the course of the research will be kept strictly confidential so that only the Lead Researcher carrying out the research will have access to such information.

What will happen to the results of the research study?

The results will be written up as part of my PhD into the Assessment, Treatment and Management of Musculoskeletal Disorders. The qualitative data collection and analysis is based on the experiences and views of practitioners and patients.

Who is organising the research?

The research is conducted as part of a PhD as outlined above and is supervised by the Department of Clinical Sciences at the University of Chester. The study is organised with supervision from the department, by Pamela Gellatly, a PhD student.

Who may you contact for further information?

If you would like more information about the research before you decide whether or not you would be willing to take part, please contact:

pamela.gellatly@healthcare-rm.com or 0818902@chester.ac.uk

Or telephone: 07717 456321

Thank you for your interest in this research



Letter of Invitation to Symptomatic Individuals

Dear [Named Individual]

I am currently undertaking research into an integrated approach to the identification, treatment and management of musculoskeletal disorders (MSDs). Further information on this research is outlined in the attached Participant Information Sheet.

As the CEO of Healthcare RM I have access to data that allows me to analyse a range of information on the illness and injuries experienced by our clients. It is from this data that I understand that you have at some point experienced a musculoskeletal problem.

I am looking to talk to individuals who experience problems with any musculoskeletal disorder to understand the variations in individual's experiences in relation to assessment, treatment and on-going management of the condition.

I would therefore like to invite you to arrangement a telephone conversation with you to discuss the nature of your condition, how this has impacted on you, what advice you may have been given by clinical and non-clinical professionals, what treatment you have had and whether you have been advised on the relevance of other underlying factors such as how you feel about your pain, the type or amount of exercise your take, your weight and your nutrition.

It is hoped that participation in the call will provide you with additional information on how you may improve your understanding of how to reduce the risk of future problems whilst also helping you manage any problems as and when they occur.

If you are willing to participate please arrange a suitable time to speak with me via your Case Manager or complete the response form below and return it to me either by post or simply email me on 0818902@chester.ac.uk. A consent form will then also be sent to you for completion. Alternatively, if you do not wish to participate then please also complete the form to avoid any unnecessary contact.

Thank you for reading this.

Yours sincerely
Pamela Gellatly

Name

Location

Note of Interest (Please circle the appropriate response)

I am interested in participating in an interview

A convenient time to speak would be

The best number to contact me on is

I am not interested in participating in an interview and do not wish to be contacted.

Appendix 5

Sample Transcript

Sample Transcript

Senior Physiotherapist

PAG: Nigel thank you for agreeing to this interview today. Could you first tell me a little bit about your background as physiotherapist, your training and your experience?

I am a Senior Physiotherapist now passed 20-year mark of clinical practice which has been exclusively orthopaedic work.

Decided to focus on orthopaedics and had short period in NHS and then left to work in private practice both in the acute and sub-acute areas.

Was undertaking NHS and private work for different people and decided to buy a physiotherapy business and manage it. Did that for a number of years and then sold the business to Healthcare RM to enable a broader understanding of musculoskeletal issues.

Over the years I could say that I have presided over and watched how musculoskeletal conditions have been managed.

I began life as a physiotherapist heating patients up and then cooling them down and giving them a bit of a rub.

At physio school there was a heavy focus on manual interventions which was under the guidance of Ann Moore.

Probably over 5-10 years of manual and exercise based practice I disillusioned as although some patients did well the majority did not or did not return to 100%. I found it difficult to understand why and decided to do more courses.

Began with the mechanics courses which was split into 4 x 5 days of increasing complexity and then an exam at end. Then I was going to do diploma in America but realised that the philosophy of managing patients was changing.

I did a hands on manipulation course - hands and snags-grade 5

I then did Kinetic control with Mark Hummerford probably around late 90s early 2000

Fair to say did every available course in that field and yet patients did not still get better as they might

I then went through a bit of a period of deflation by this and then two to three things happened simultaneously as I started to notice:

Somebody might come back and say that my hip was not that bad and I have got on my bike and got better- so began to notice something was going on in consultations

A few defining moments one was a lady with an OA hip and crying in pain. At that time, she was on a waiting lists for anything between 18months 2 years- so quite common. GP was fairly powerless and phoned him up to see if there was anything he could do and he could not. I therefore forgot about her and then blow me, one day I went to buy a sandwich and she went passed me on her bike. I later found out she has seen the consultant and that she

had been told that her hip was not that bad and that maybe it was this message that had helped her to cope.

Me and the GP had been misled by her symptoms so in a very amateur way I started to play around in consultations and think about what I said.

I met Dr. Grahame Brown who I initially went to see to learn joint injections but what I noticed was that his style of consultation was very different - he empowered the patients by asking them what they wanted rather than what talking to the about what he thought they needed

Even when he gave people news he would do so in a way that was more about - so let's see how it goes - so thought something going on with this consultation stuff so I plague him

I went up to every clinic he did that he did for 18 months and I also did some courses that at the time would be considered left field communication, storytelling, and psychological stuff. I began to read about things that had been written as is often the way. I first met Dave Rogers who opened my eyes to there is a different way and he was developing the frog programme though HCRM

We saw a group of patients in Bristol and we took them to a gym and let them do their own thing and did not mobilise them. I was outside my comfort zone already and then he talked about the psychological issues.

I have over the last few years done less to patients -far more interested in their stories and why they are consulting and why their nervous systems still feel under threat. Since then on a commercial aspect and on the NHS trying to implement this as a strategy for managing musculoskeletal pain. The other aspect or what I have learnt is that the hidden bit is what is going on in the person's life outside of their pain with their job and their family. Learnt a lot about those occupational factors such as sick pay entitlement, their benefits, issues such as disciplinary's and other work factors such as relationships etc., and how they enjoy their job.

PAG: What other factors do you think are present?

Lorimer Moseley's books that he wrote as he was dying from cancer where he had been championing a different approach to MSK the whole of his career said that he feels we are far as way as we ever were.

I am no longer surprised when we meet freshly training physios that they are aware of the factors but unable to identify them and then they do not know what to do with them if they do.

It is difficult their training is not focused on helping them with that - having worked with a group of physios for a number of years it is threatening for them to let go of what they know - some of these psychological factors are outside of their scope. They think that having conversations about factors such as mental health are risks. They are anxious and can get depressed about doing this as they do not want to open a can of worms.

Not unusual for people to say I AM NOT COPING and want to end my life and then the physio does not know what to do

Physio tend to be conscientious and like to tick boxes and this model does not let them do this. This approach is more difficult.

PAG: Who should do this then?

Physios are well placed to deliver this in that they can give the patient the reassurance and it is relatively easy to drift into this conversation and having worked to a CBT therapist she is reluctant to see the patient if the patient has not been seen by a physiotherapist or other clinician as she does not understand the medical aspects

Should add that the pendulum does not swing in other direction and there is disease and pathology. So need to get this right to develop how it is going to be done differently.

PAG: How about a multidisciplinary route? e.g. bringing a CBT therapist in

Using the framework, physiotherapists are actually able to manage a significant number of patient, in its purest form and then management of those more resistant cases it is sensible to bring in a CBT therapist or where the predominate feature is mental health.

So may see PTSD patients and the MSK issue is not the real issue PAG - Is this approach understood in the NHS and the private sector

Adopting either or approach to manage patients is what I have said we need to split them up - So we have a mechanism of treating both

Our experience of mental health in working in MSK is that the training of CBT therapists is in mental health rather than managing psychosocial factors associated with MSK disorders. The problem is that the person has back pain but they are not depressed and therefore they do not need CBT

I can talk with authority being involved in accessing care for patients through a number of practitioners including surgeons and physicians and identifying psychosocial factors is almost totally absent in their letters

Very scant weight is placed on it in their clinical assessment and I would be hard pressed to find any more than 5 in 100 letters where this is identified

When they are then they are often also identified as the reason for not getting better

Ongoing emphasis is that the research would have us believe that a person's pain is related to a weak muscle rather than fear avoidance - so what do the physios do?

They do what they have been trained to do

Physical therapy and injection or Surgery and then Pain Management when they get better Pain Management consultants give medication and then send back to another physiotherapist

It is moving and ultimately it is about educating clinicians

Engle in 1971 or 1977 in the New Statesman wrote about the biopsychosocial approach and the need for education. Yet it is still not understood. On its own it does not seem to do the trick but the new draft guidelines (NICE) are about a more combined approach - physical and psychological. But on the other hand apprentice training has not changed and these cases are difficult to manage. As a practitioner you need help. When you have a case like this you need to have a whole set of case skills to manage the case including communication skills and a framework to manage what you find

Skills around motivational interviewing and to how to help the patients help themselves would be a start.

PAG - what do you find Patients understand about their condition

People remain in a model of receiving care I think that is a criticism of our inability and lack of enthusiasm and if we look at cost then there is only a fraction spent on patient education.

PAG - Has this got better or worse?

I don't see a huge shift asking for a different approach - most patients expect physio to do something in the consultations in the few visits and then that mind set is fairly common

We have set up a perfect storm sending a message that failure to resolve that further investigations are required and also dare I say it - media misdiagnosis and the patient that went back 10 times and were not able to diagnose and sometime education does not always give outcomes that want and reassurance itself is not always enough

PAG - what about the Public Health issues?

Do not meet many people on stress that release that being overweight, exercise or drinking too much is not good for them and many patients are trying to do something

Discrepancies between exercise and what people do

Sometimes one patient looked at me and said that there were exercising because they put the washing into the washing machine. Knowing what exercise is and what people understand may not be clear and they do not know what they are meant to do and hence cannot engage.

I would be surprised if people do understand but I believe most do not I am far more aware that joining the dots is the way forward.

Hypertensive, overweight, not doing as much exercise and having a job that is stressful is what I see. We need to remove some of linearity and if we just get them to lose weight and making bigger lifestyle changes then that feels like far big task and a lot more difficult to make that shift.

The more we learn about health the more we find a situation that will affect all aspects- namely the psychosocial factors which then drive behaviours.

PAG - any Ideas on how we should approach this?

The influence that individual therapists on a one to one basis can have are limited. We need to get a more joined up strategy to help people eat better and exercise -we have had a lot of carrot in the system such as we will help you stop smoking and maybe we now need to introduce some stick.

Some Trusts are now refusing operation on patients with a BMI of over 40 for OA hips and knees and many of the things we do in life have a combination of effects.

PAG - Should the stick only come from the medical profession or should it come from other sources?

We should lose the idea that everyone needs a health intervention

The idea that the Healthcare system going to do it and changing this to say they will not, simply sending that on its own is very powerful - I do think there is a whole host of other stakeholders and people may want to look at this

PAG - How about occupational aspects?

It is about - do they want to spend no time looking after their employee? People who are not fit for work or impact on work

PAG - how about accusations of a Nanny state?

I would not want the person to drive my bus or flies my plane to be unfit and we need to be able to see where we are going with this

Is it reasonable for people to take responsibility for their own health and actions and give the system an opportunity to care for the people who really need that and we cannot go on as we are?

PAG - Is it coming unsustainable?

Definitely in most NHS trusts there is an ageing and less fit population who are demanding more and more and therefore it cannot be sustained.

PAG - How about the Olympics legacy and people getting fit?

Few people I see are trying to get fit - or maybe I feel more sympathetic to them

I wonder thought is how many more people are exercising or is that it is those that do are exercising more
Exercise is a risk for MSK they will get more aches and pain if it is a consequence and a small price to pay

PAG - How about the Chronic patients you deal with?

Quote for Malzak and Wall 20 years ago they were appalled by the number of patients left in pain that interfered with normal activities and they lay the blame on the health professional not keeping in pace with pain science.

They are some early shoots they (practitioners) are starting to change but we are still being drowned out by more biomedical approach

The more complex intransient case

We look at them at say what would happen if they had had a different approach often by the time we see then so entangled in their pain that they are have become modification in a living care system not able to be help, so health intervention unlikely to change them and we cannot be surprised that they are not motivated.

They are often more women and lower socio economic groups lower standard of education often smokers and often people who have lives that you would not wish on anyone, life has thrown at them domestic abuse, sexual abuse and violence.

Don't see these type of patients in the commercial organisations - although most patients don't tell you everything that is influencing their health they may not see the connection or may be embarrassed but problems around debt and alcohol are out there in society and yet they are not that common.

PAG -What about what you see in the workplace individuals?

Most of the time are framework understanding their belief about why they have pain it is common for them to be linear in their thinking - I have my pain because I carry my laptop in my bag or I have to drive and this causes my problem - it is only when you can work with these people that you can help them understand that they can improve

PAG -What do you think about private healthcare plans?

We should keep patients away from health professionals there is reasonable evidence that the disability associated with the condition may be made worse by health professionals

PAG - Should we make people more aware of this?

I would think we need to be more aware of the issues that drive MSK pain and that there are some that will be modifiable via healthcare intervention, some that are caused by beliefs and behaviours and many of them by cultural changes- in organisations.

PAG - could you expand on this?

So you may have an organisation a commercial organisation which as a good employer are prepared to bend over backwards to help but in doing so ends ups with people on modified duties or strange working patterns. This then means that the people become annoyed if they have to change and makes it very difficult to a clinical perspective to get them back to normality.

Some may have a situation such as a culture of bullying or other work practices which drive tension and with confidentiality it is difficult to have an open dialogue.

No stakeholder is to blame

PAG - Is confidentiality a barrier?

Yes, it can be a barrier and we often hide behind it

PAG - What should we do about this?

The equality act should be thrown out

Very few problems when employees feel that company has been balanced in their response but not uncommon to find an employee disgruntled if their employer is unwilling to make modifications to give a role or increase holiday and we need to be more open about what we are trying to achieve and why and work at understanding the position from both sides but that the employer can only go so far.

If you are long term sick you should consider how long your employer will support your sickness and not expect this to be ongoing.

PAG - are employee's expectations too high?

lightly paternal view of the world is that now the NHS is there and employers offer support that this can work against personal responsibility and self-help. In general conversation people will talk about "this is my right" without really understanding what this means.

Quite legitimately we want to help people when they suffer but sometimes we help with some stick rather than carrot. Interesting since government change disability require that people said I can no longer claim but have to go back to work and this indeed is helping

We have set up a culture of entitlement and in a section of population

PAG - What section?

Difficult to see at both end of the spectrum - social economic groups can equally be high paid within organisation which feel they have an entitlement or insurance product - but maybe a more general culture and I do not know without moralising too much, we are a culture if I think about my peers where if they move house the first thing you do is to replace the kitchen, the bathroom, change the car have a flat screen TV and do not know what it is like to be poor. Equally people with less money will still focus on material things.

So people are no longer interested in waiting or working for something - instead they focus on my life is not fair as other people can have a new bathroom.

Entitlement in the unintended consequences of changes within NHS very common for us to see an elderly lady hoping that her bad knee or neck would go away and will not put strain on NHS but a younger person more likely to seek what they see is their entitlement for relatively minor things.

Difficulty in private sector more difficult to manage care because of expectations and may be NHS is big organisation and difficult to challenge.

Younger people world is a different place then used to be. Pressure on younger people that I never encountered. Young people I work alongside are far more senior and grown up but this comes at a cost and there are so many pressures- social media pressure to get jobs that manifest in stress and many more young people living at home and not having to fend for themselves, so I think we do see more of those groups early and they are extremely difficult to manage. We are find family we retain much more of an influence.

PAG - Is this going to get better or worse?

It will not get better in short term a but housing.

PAG - Moving to the other end of the spectrum what issues do the older generation face that are still working?

We are getting to grips with this - not any doubt that we see more patients with degenerative problems that are probably being contributed to by weight. In the NHS we need to understand how we should manage those patients and I am sure that we are probably doing less intervention and more education. Surprisingly it is not that difficult with this population as most people have heard bad stories, and they are more receptive to self-help - only 10-20 would want to manage symptoms differently but quite high drop off in making the type of change and their path to a different intervention.

How about work?

Lots of people accept they will have to work longer pension that might not pay out in the way that previous generation has done and I have lots of conversations about changing their type of work to ironically and more sedentary and less hours and then deciding to make that change and phase that.

Are you suggesting that this is not so good?

It is ironic that we want people to become more active and maintain their activity and yet people wonder whether they can sustain that over a longer period

The balance between activity strength and the hidden bit is whether they enjoy what they do and far more likely to do what they want to do

More wanted and more wanted.

Anything else

At a shifting point are we going to manage MSK problems like we manage them now

I would hope no in future less treatment and less investigation and less need to access healthcare and helping people live better lives

Education and reducing access to health care.